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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD

APPEALING TO THOSE ENGAGED IN

THE ART OF BUILDING.

*IT is our aim, our ambition, our aspiration even,
to build our Journal worthily and well, not
for the hour only, but for future years; for the
few men in the forefront of an enduring and
a laborious Art; for the disciplined ranks of a
distinguished Profession; for the young men—
Architects to be—and for all who love a clustered
column or a flying buttress, a traceried window
or a Greek frieze; for the man, too, who honestly
plumbs a jamb*

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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

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6, Great New Street, Fetter Lane, E.C.

Summary.

The principal feature of the New Mersey Docks and Harbour Board offices at Liverpool is a great central dome, the height of which is 220ft. from pavement level to the top of the cupola. The foundations of the building consist of concrete arched piers resting on a bed of solid rock and carried up to within a few feet of the street level. (Page 2.)

M. Considère has shown that metal employed in the form of bands has, from the point of view of resistance to compression, an efficiency 2·4 times greater than that used in the form of longitudinal reinforcement. Banded pieces prepared in the workshop with all possible care, and made with a very rich concrete and subjected to initial compression, offer a resistance to compression comparable with that of a structure of riveted steel of the same weight, and are less expensive. It is safe, therefore, to prophesy that banded concrete will be able in a large number of cases to replace with advantage the compression members made of rolled steel sections in a large metallic structure. The tension members would consist of bundles of round bars lightly banded and dipped in concrete. The connections would be more easily made than those of other frameworks, and could be reinforced by a supplementary banding. Such structures would have an unlimited life with practically no expense for maintenance. (Page 10.)

There are fine screens with rood lofts in the churches of S. Beuno at Clynog and S. Einion at Llanengan, and that at Llanegryn. (Page 13.)

There is a proposal to erect a statue in memory of the late Duke of Cambridge in the neighbourhood of the Horse Guards, but as yet no site has been selected. (Page 5.)

Students desirous of taking a holiday in Cornwall and doing some sketching should make their headquarters at Fowey, which is on the sea and has an excellent church, and forms a centre for railway excursions to places of architectural interest such as St. Blazey, Bodmin and Padstow, which all contain good examples of ecclesiastical architecture. (Page 12.)

Asked if he could arrange that the materials to be used in the erection of the College of Science in Dublin should be Irish, and that Irish workmen and architects should be employed on public works in Ireland, the Chief Secretary replied that he did not consider it feasible to restrict contractors in the choice of their workmen and materials, but that where practicable preference would be given to Ireland. (Page 5.)

Improving the Marble Arch. ANY attempt to improve the surroundings of our public monuments is worthy of support, and we welcome the suggestion for the improvement of the Marble Arch made, on the occasion of the King's birthday, by Mr. F. W. Speaight, the well-known photographer, of New Bond Street, London. His plan is to construct a large semicircular screen of railings and gates of 360ft. diameter behind the Marble Arch, the object being to make it stand out boldly, as a triumphal arch should do, instead of being crowded in as a mere entrance to the park. Mr. Speaight points out that there is no sentimental case against the change, as the arch was originally intended as a main entrance gateway to Buckingham Palace, and was removed in 1851 to its present site, and that no financial objection could be serious since the cost of acquiring the only private property which would be interfered with, namely, a stable, and the making of the roadways, would only be about £15,000, practically the whole of the land being taken from Hyde Park. The suggestion is certainly worthy of consideration, and Mr. Speaight himself asks for criticism from architects, artists and others who are better able to judge the merits of the scheme, and to suggest the best means of carrying it out. The author unfavourably contrasts the present situation of the Marble Arch with that of the Arc de Triomphe, in Paris, but it should be recollected that his scheme only deals with one aspect of the arch, namely, that to Oxford Street, and leaves the present prospect from the park practically untouched; and in view of this the suggestion of making a new processional road from Constitution Hill and the Mall, with this as a finish, loses its chief argument. The fact that the suggested crescent and screen, if carried out, would be only of advantage looked at from Oxford Street, would require the screen to be of something more impressive than railings and piers. A stone screen or cloister would be better, and we have quite enough bare spaces of gravel, wood blocks or asphalt around our public monuments to urge that in this case floral or grass plots should be adopted. The plan for bringing the screen across Park Lane is also open to objection, because it would force this main traffic road to be swung round sharply at the Oxford Street end, which is anything but desirable. The fact of the matter is that the Marble Arch is not in a good position for any alteration; but as it has been moved once it might be as well to

consider whether it should not be re-erected to face the Edgware Road. One detail of Mr. Speaight's scheme, namely, his suggestion of improving the present type of electric lamp standard by carrying it still higher to 50ft. in the form of a Venetian mast, we do not favour. It looks spidery and dwarfs the surroundings. To place a powerful light high up is not an economical form of illumination; the lamps should be of medium intensity, lower down to the ground, and more numerous, to be effective.

The Glass Combine. THIS is the day of combines. We have had the Shipping Trust, the Imperial Tobacco Co., the Associated Portland Cement Manufacturers, the Wallpaper Manufacturers; and now the movement has reached the glass trade. For several years past British glass manufacturers have received severe competition from Belgian firms, and practically only three English firms have been able to stand the strain. These are Messrs. Pilkington Brothers, Ltd., of St. Helens; Chance Brothers & Co., Ltd., of Birmingham, and the Glasgow Plate Glass Co. It is now stated that these have come to an arrangement with the Belgian manufacturers, who are the only serious rivals to the British firms in Europe, whereby they shall not send to Great Britain or any British colony any rolled plate, muranese, tinted and embossed glass except to the order of the three British firms mentioned, who have presumably undertaken to accept the delivery of a certain proportion of the Belgian output and not to compete against Belgian firms on the Continent. It is said that the agreement is to remain in operation for five years. Further developments are expected in the sheet glass trade. The consequence will be no doubt a rise in the price of glass all round. The quantity of Belgian rolled plate, muranese and cathedral glass imported into this country probably equals if it does not exceed the total output of the three British firms, who cannot supply the home demand, and hence they will be enabled to make considerable profits. Already prices have increased upon those of last year. While prices are kept down to a reasonable figure these combines need expect no rivalry, but if they become exorbitant competition must be expected from other countries. We have heard a good deal about competition from German and American firms in the wallpaper trade, but while prices remain as they are there is little likelihood of this coming to pass.

LIVERPOOL DOCKS OFFICES.

A Huge New Building.

THE new head-offices for the Mersey Docks and Harbour Board, illustrated in this issue, are being erected upon the site of George's Dock, Liverpool, and have a frontage to the river of 264ft. The approximate area occupied by the building is a little over 1½ acres. It is in the Renaissance style and the materials used are Portland stone and grey granite backed with common bricks.

The principal feature of the building is a great central dome, the height of which is 220ft. from pavement level to the top of the cupola. There are also four corner towers, two 143ft. high from the street level, built in grey granite from ground to first floor: these towers will contain the principal entrances coming from the city, and will be approached from the street by a grey granite staircase. The main entrance to the building faces the river front and will have a grey granite staircase leading from the street level to ground floor.

The foundations of the building consist of concrete arched piers resting on a bed of solid rock and carried up to within a few feet of the street level.

Fig. 1 shows the concrete piers at springing level; Fig. 2 the concrete foundations of the central dome; Fig. 3 the commencement of the steelwork to the main building; Fig. 4 the elevation on the south side, showing the early stage of fixing stone. Fig. 5 shows the construction of the steelwork to the central dome, taken on July 28th, 1904; Fig. 6 gives another view of the dome show-

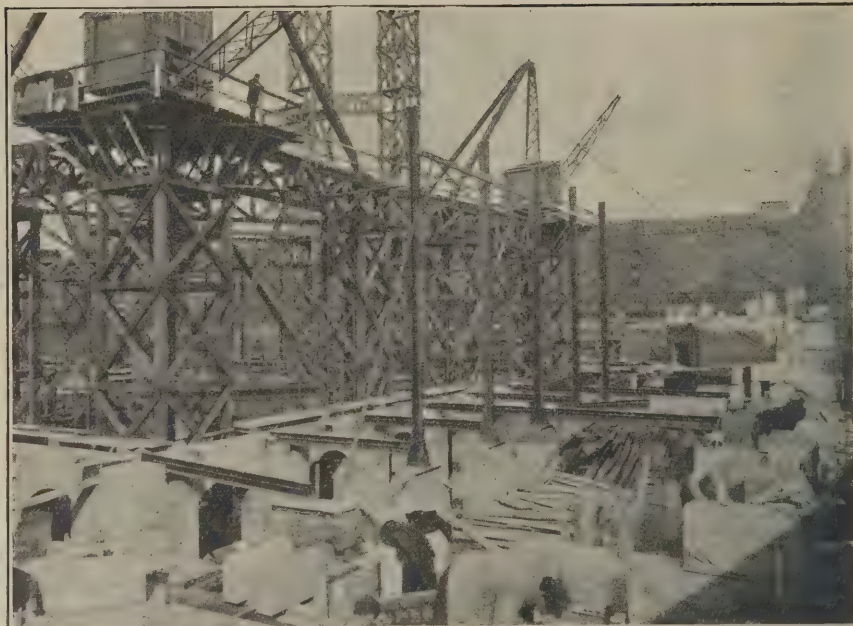


FIG. 3.—VIEW FROM SOUTH-EAST CORNER OF SITE, TAKEN ON MARCH 23RD, 1904, SHOWING THE WORK AT STREET LEVEL.

ing the concrete arching to carry masonry, and Fig. 7 shows the steel construction of the dome; Fig. 8 shows the detail of the steelwork to the cupola of the dome, taken at Messrs. Dorman & Long's works before being fixed on the building.

A view of the stonemasons' yard at the side of the building, showing 300 masons at work, was published on p. 25 of the supplement to our issue of December 28th last. This is one of the most modern equipped masons' yards in the country, every mechanical appliance



FIG. 1.—THE ERECTION OF THE MERSEY DOCKS AND HARBOUR BOARD OFFICES, LIVERPOOL: VIEW LOOKING EAST, ACROSS THE CENTRE OF THE DOCK, TAKEN ON DECEMBER 23RD, 1903, SHOWING CONCRETE PIERS AT SPRINGING LEVEL.

possible being utilized in the working of the stone with a view to economy and speed. On the right hand are seen the banker-hands and on the left the shedding covering the planing and moulding machines, lathes, circular saw, with the swing saws at the far end, all worked by electricity.

Fig. 9 shows the south-east corner, taken on September 27th, 1904. Another view showing the general condition of the building on October 27th, 1904, was also published in our issue for December 28th last. Fig. 10 is a view of the frontage to the river and Fig. 11 shows the aspect to the south-east; Fig. 12 is a view taken on April 28th, 1905, showing the roof spans along the east side of the building, looking south.

We propose publishing further photographs at a later date.

The excavations for the concrete foundations were not commenced until September, 1903; the average depths are 50ft. below street-level. At the present moment the roof is being fixed to the four sides of the building and a portion slated. This is remarkable progress for a classical building of this kind, considering the difficulty experienced to get from the quarries at Portland the very large sized blocks of stone required, the weight of some of these, when worked, being more than 5 tons.

A striking feature in the erection of this building is the excellence with which it is served by cranes, these having steel jibs of 80ft. commanding the whole area, and being of the most modern type, operated by electric power. The architects of the building (a perspective drawing of which will be found on p. 9 of the supplement to our issue



FIG. 4.—THE CONDITION OF THE SOUTH FRONT ON APRIL 22ND, 1904.

for December 28th last) are Messrs. Briggs & Wolstenholme, F. B. Hobbs and Arnold Thornely, of 51, North John Street, Liverpool,

and the builders are Messrs. William Brown & Sons, of Trafford Road, Salford, Manchester.



FIG. 2.—THE ERECTION OF THE MERSEY DOCK AND HARBOUR BOARD OFFICES, LIVERPOOL: VIEW LOOKING EAST, TAKEN ON FEBRUARY 24TH, 1904 SHOWING FOUNDATIONS OF CENTRAL DOME.

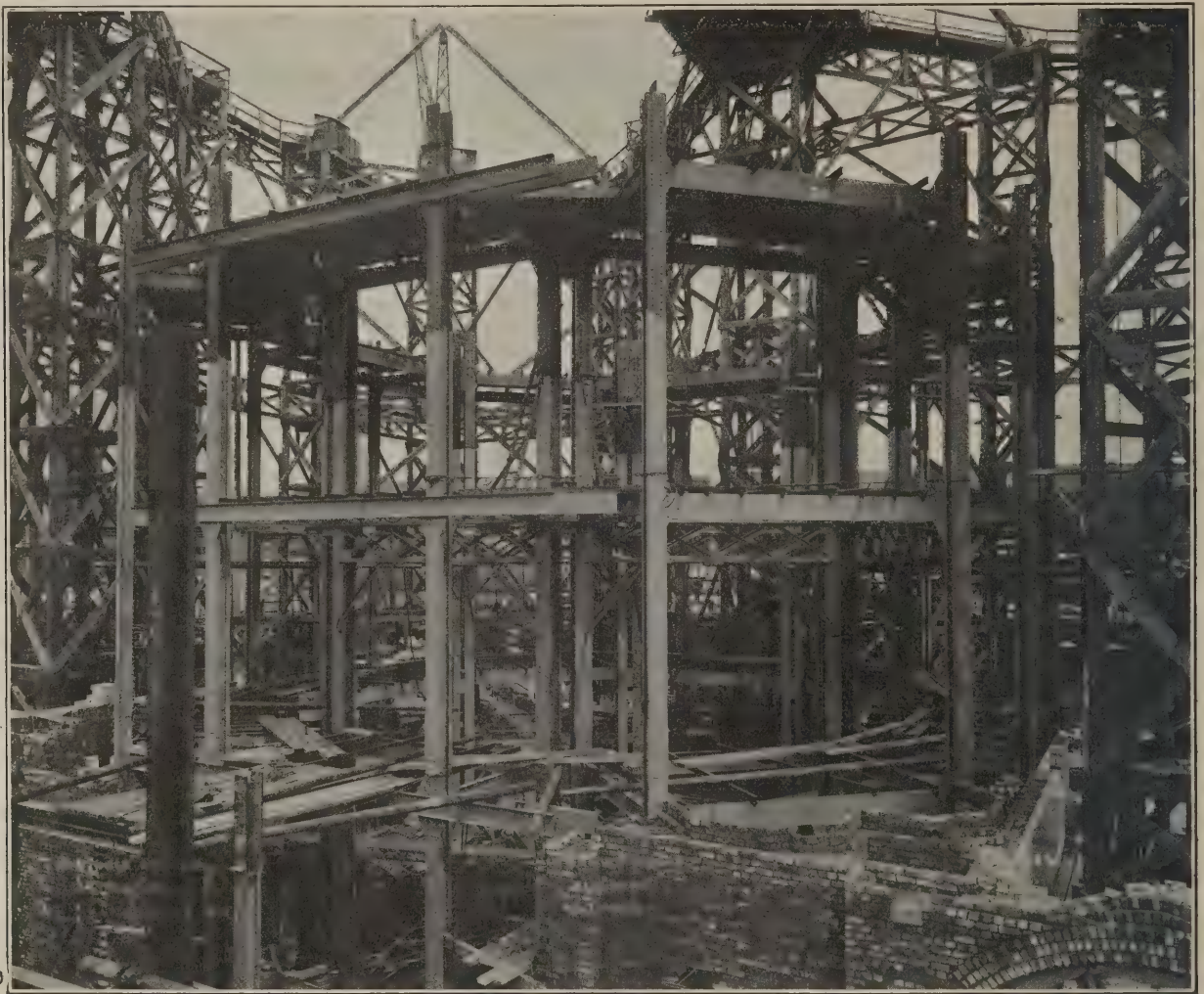


FIG. 5.—FRAMEWORK OF CENTRE DOME OF NEW MERSEY DOCKS AND HARBOUR BOARD OFFICES LIVERPOOL: VIEW TAKEN ON JULY 28TH, 1904.

Views and Reviews.

Elementary Building Construction.

This is an addition to the list of books on building construction intended, primarily for elementary students in technical institutes; and while it is on the whole of equal merit to its fellows, and in some few respects superior, it suffers from the same defect of treating the subject from a school teacher's impracticable point of view. The subject is dealt with more as a hobby or an exercise, and the vital relation of the subject to practical conditions is often lost sight of. We are still waiting for the book which shall treat the subject in a scientific and practical manner—that is, a book which, while being technical, will at the same time be perfectly clear to the young student. Mr. Booker has certainly done well in this work to treat materials more fully, and the illustrations are very clear and numerous, but it is not written in such a happy style as we could wish. The sentences are often involved, and several grammatical errors are noticeable. There is no reason why the matter should not be treated brightly and interestingly. Mr. Booker divides the book into the usual sections, such as brickwork, carpentry, joinery, slating, tiling, plumbing, &c.; chapters being devoted to such details as roofs, partitions, beams and cantilevers, and damp-prevention. This method is decidedly objectionable, because the student is immediately plunged into the details of the subject before he has grasped the principles. Any book which claims to be a proper educative medium must develop the subject gradually from the sciences of mechanics and chemistry. As to the latter all the authors of works on building construction up to the present have been strangely neglectful, with the result that their explanations of materials and the effect of conditions upon them are often absurd



FIG. 8.—STEELWORK OF CUPOLA OF DOME.



FIG. 6.—THE DOME FROM ABOVE ON FEBRUARY 27TH, 1905, SHOWING CONCRETE ARCHING TO CARRY MASONRY.

and lead to rule-of-thumb methods which are the great bugbear of the building trade. The old traditional system of instruction under apprenticeships have now gone by the board and the polytechnics have taken their place. While technical schools are an improvement in many ways upon the apprenticeship system, yet they are not so efficient in others. Architects and craftsmen in the old days were led to understand practical conditions in actual work, and if not taught scientifically, gained sufficient knowledge in the school of experience of the reasons for the various forms of construction which enabled them to use these intelligently without producing such illogical results as appear to be the general characteristic of much of the present-day constructive work. It was true they were not very inventive and did not quickly respond to altered modern conditions, preferring to adhere to the methods with which they were well acquainted; but if the technical institutes are to adequately supplant the apprenticeship system they must be more thorough. We are reluctantly compelled to conclude that this book is not one that will help forward this object.

"Elementary Practical Building Construction," by F. W. Booker, F.S.I., London: Longmans, Green & Co., price 2s. 6d.

IN PARLIAMENT.

(By Our Press Gallery Representative.)

MR. BRYCE asked Lord Balcarres whether the attention of His Majesty's Government had been called to the intention announced by the town council of Berwick-on-Tweed to sell for building purposes a piece of land on which there stood parts of the ancient walls of that town, dating from the time of King Edward the First; and whether, having regard to the great interest of these walls as being one of the best examples of mediæval fortifications still left in this country, His Majesty's Government would take such steps as were within their power to prevent the destruction of this important monument of antiquity.

Lord Balcarres said the answer to the first paragraph of the question was in the affirmative. His Majesty's Government had entered into an agreement with the town council by which they had succeeded in preserving the most interesting portions of the remains of the fortifications, including the Bell Tower, and it did not appear to be possible to do anything more at present.

Mr. Trevelyan wished to know on what

spot in the Horse Guards Parade it was intended to erect the statue of the Duke of Cambridge.

Lord Balcarres replied that there was a proposal to erect a statue in memory of the late Duke of Cambridge in the neighbourhood of the Horse Guards, but as yet no site had been selected, and it had not been suggested that it should be erected upon the Horse Guards Parade.

Mr. Herbert Samuel enquired of Lord Balcarres when the repairs to the fountains

in Kensington Gardens which were now being again undertaken were first begun; in what those repairs consisted; when they were likely to be completed; whether they had been carried out by a contractor or by the Office of Works; what was the cost originally estimated, and what was likely to be the actual cost.

Lord Balcarres stated that the honourable member was under some misapprehension as to the repairs to the fountains in Kensington Gardens "now being again undertaken." All works were completed some three months back. The fountains were started in April of this year and had continued playing since. The renewal of the deep-well pumps, the removal of old boilers and the supply of new, and the rebuilding of the engines commenced in 1903. It had been necessary to deal with the service in sections. The works had been carried out by contractors, the original cost being estimated at £2,448 and the actual cost being £2,583.

Mr. Field asked the Chief Secretary for Ireland whether he would arrange that the materials to be used in the erection of the College of Science in Dublin should be Irish, whether he was aware that a greater portion of the material used in the Albert Agricultural College was imported, and whether he would see that Irish materials should be used and Irish workmen and Irish architects employed on public works in Ireland.

Mr. Victor Cavendish replied: "As I have stated on several previous occasions, I do not consider it feasible to restrict contractors in the choice of their workmen or materials, but I have no doubt that where practicable preference will be given to Ireland. As regards the Albert Agricultural College, I am informed that it would be incorrect to say that the greater portion of the building materials used were imported."

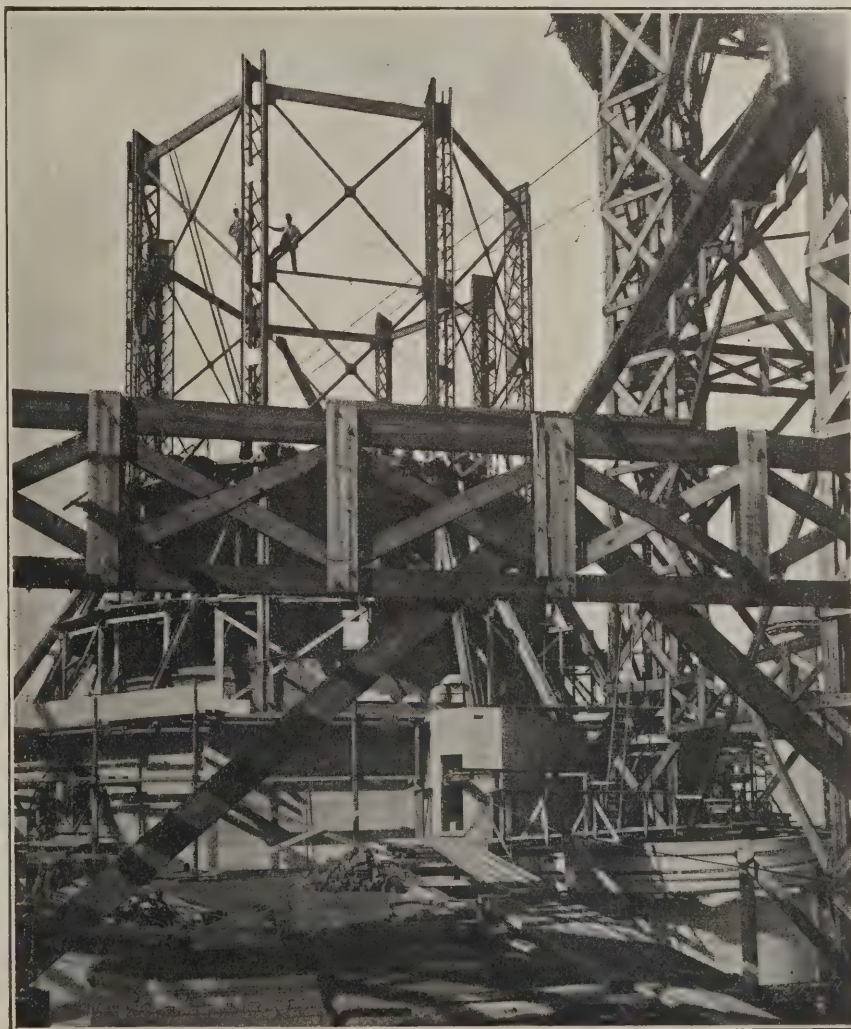


FIG. 9.—FRAMEWORK OF DOME FROM ABOVE (TAKEN ON MARCH 27TH 1905).



FIG. 10.—VIEW OF WEST FRONT OF THE MERSEY DOCKS AND HARBOUR BOARD OFFICES, LIVERPOOL, TAKEN ON APRIL 28TH, 1905.

THE FIRST WALLPAPERS.

THOUGH wall-hangings made of paper had been in use among the Chinese from very early times, they do not appear to have been adopted by the West until the middle of the sixteenth century, when they began to be imported by Spanish and Dutch merchants; but it was not before the end of the following century that this less costly substitute for the tapestries, silk and satin damasks, figured velvet, stamped leather painted and gilded, which formerly adorned the wall of the fortunate, found its way into our islands; it was a hundred years again, owing to the excessive tax which hampered the industry, before it became possible for their manufacture to be carried on at home on any considerable scale.

The early experiments, says Mr. A. G. B. Russell in the "Burlington Magazine," which preceded their introduction from the East were, as is naturally to be expected, of a purely imitative character, consisting of an endeavour to supply colourable reproductions of the fashionable hanging in a cheaper material. As is also to be expected, the result was possessed of little or no artistic merit. But there was one exception. About the time of the accession of William and Mary, a few years after the Chinese craze had invaded England, wallpapers designed and painted in China began to reach our shores. The *rapprochement* with Holland (whose Oriental trade had long ago provided this luxury for herself), consequent upon the arrival of the Dutch prince, was to some extent responsible for this; but our own East Indian Company, which had first

touched China in 1637, had at this time a rapidly increasing traffic with the Far East. The coming of wallpapers to match the prevailing taste was joyfully welcomed in polite households, and though they were far from being cheap, they were widely employed both in England and France, and remained in fashion for at least a century and a half.

A delightful wallpaper of Chinese origin has been hanging since the close of the seventeenth century on the parlour walls of a house, formerly in the possession of the Berkeley family, at Wotton-under-Edge, in Gloucestershire. It is thus one of the very first of the Chinese papers to have been put up in an English house.



FIG. 12.—ROOF SPANS ALONG THE EAST SIDE, LOOKING SOUTH. VIEW TAKEN ON APRIL 28TH, 1905.

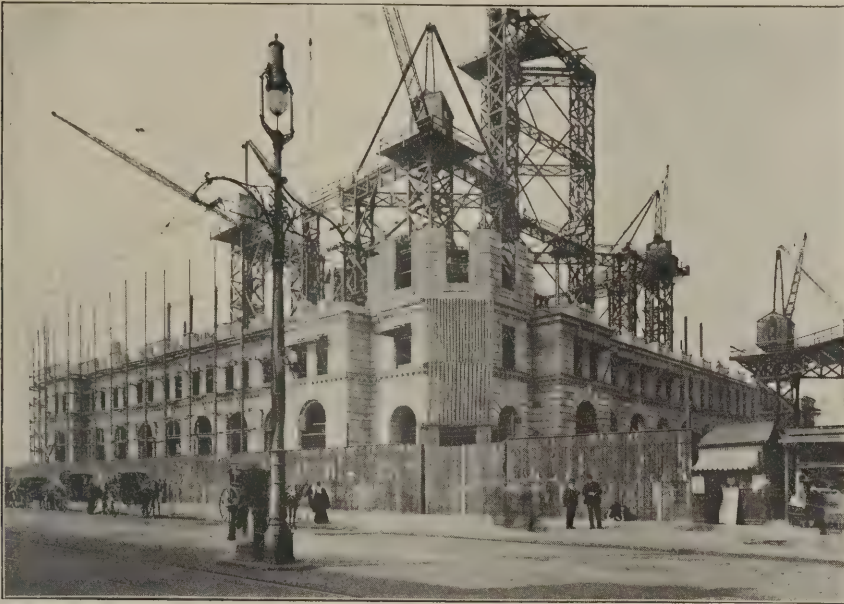


FIG. 9.—THE NEW MERSEY DOCKS AND HARBOUR BOARD OFFICES, LIVERPOOL :
VIEW FROM THE SOUTH-EAST TAKEN ON SEPTEMBER 27TH 1904.

FERRO-CONCRETE.

SOME OF ITS MOST CHARACTERISTIC APPLICATIONS IN BELGIUM.*

By M. ED. NOAILLON, of Chenee, near
Liege.

FERRO-CONCRETE is a material which was unknown to the general public a few years ago, but has now entered with phenomenal rapidity into all branches of constructional work. This result is due to its remarkable properties, which may be stated as follows:—

(1) The economy rendered possible by its use as compared with other systems.

(2) Its resistance to fire, which is now put beyond doubt by numerous tests, some made for the purpose and others the result of accident. It is moreover the only flexible material which possesses this quality of fire resistance; and after the results of the disastrous fire at Baltimore it is clear that very little confidence can be felt in the use of metallic frameworks covered with thin coatings of refractory materials.

(3) It is unaffected by atmospheric action. Concrete is from this point of view comparable with stone of the best quality, and it improves with age. As to the metal built into the concrete, it has been proved that it is perfectly preserved without loss of weight, and that even if used in a rusty state it will recover after some time the bluish tint which it possessed when leaving the rolling mill. This almost incredible result is due to a chemical action of the cement and probably to the formation of a protective coating of silicate of iron. Concrete also resists equally well the effects of corrosive fumes and liquids which are feebly acid. It may be used for marine works if the proportion of cement employed be high.

(4) The ease with which the material may be made to take any desired form. While preserving the architectural appearance of stone a boldness in construction may be attained which is impossible with the latter material. It is merely necessary to measure the materials precisely; an error can be corrected during construction and unforeseen details can be improvised. This adaptability is specially valuable in dealing with existing structures.

(5) Its homogeneity, and the mutual support which neighbouring parts give in resisting concentrated loads. Joints are no longer weak places. Girders which cross pass through each other without a break. Monolithic constructions are rendered possible which are far more resisting than others to secondary stresses.

(6) Its rapidity of execution. The constituent parts are merely raw materials requiring no previous preparation, and therefore procurable without delay. The individual importance of the single parts is negligible, thus rendering them easy to obtain, transport and erect. Night-work also does not occasion the noise caused by riveting.

(7) Its impermeability, if it has been "floated" immediately after construction in a careful manner. Under such conditions it may be used in the construction of flat roofs, reservoirs, sewers, &c. The monolithic structure which is also watertight may be produced without crack or re-entering angle, so that it can be freely washed down with the hose. Such a structure is essentially hygienic.

(8) Its great rigidity and the localization of the effects of shocks.

Concrete.

The material is an agglomerate of hard stones bound together with cement. As cement is expensive and contracts considerably, it is of advantage to use the least possible quantity by reducing the volume of the voids between the pieces of stone. This result is obtained by using a mixture of materials of different sizes, such as gravel and sand. Moreover, in order to disperse the cement with great certainty equally through the mass it should be mixed with sand only. Instead of gravel, granite chips, the refuse of the quarries, may be used with advantage. Although these chips cause more voids they nevertheless give a tougher product owing to their angular form, which increases the adherence. Granite dust may also be used instead of sand. The choice of cement is of the utmost importance, and in order to be quite certain it is desirable to use only Portland cement of a well-known brand; according to the nature of the work the concrete contains from 350 lbs. to 700 lbs. per cub. yd.

In systems of construction where the metal framework can carry by itself the whole load, and where the concrete is merely intended to protect the metal, to fix it, and to hold its different parts together, then, the quantity of cement may be reduced to the minimum and the gravel may be replaced by slag or by coke-breeze. The concrete is far weaker than the other, but it is less expensive, lighter, more refractory and more sound-proof, and nails can be driven into it.

Metal.

At the present time the metal almost exclusively employed is mild steel with an ultimate tensile strength of 27 tons per sq. inch. This costs no more than iron, and has the advantage of possessing a greater tensile strength and a higher coefficient of elasticity than the latter metal.

Round bars are generally used, as they facilitate the escape of air and the proper ramming of the concrete; they also possess no sharp angles which would cut the concrete, but, on the other hand, the round section gives the lowest coefficient of adhesion for a given cross-section of metal.

Centering.

The construction of the centering is the most important part in the erection of structures in ferro-concrete. It takes up the most time and seriously enhances the cost of



FIG. 11.—VIEW FROM THE SOUTH-EAST, TAKEN ON APRIL 28TH, 1905.

* A paper read before the Liège meeting of the Institution of Mechanical Engineers.

the work. In the design of the centering the contractor has an opportunity to exercise all his ingenuity; to use wood which can be again employed, and to avoid cutting the wood into short lengths and so causing waste of material. If vaulted forms have to be constructed the cost of the centering may be greater than that of the ferro-concrete itself.

Certain systems reduce or even obviate altogether the use of centering by the employment of metalwork of sufficient strength or pieces of concrete specially made for the purpose. Mouldings as a rule are roughly formed in the concrete by centering, and then finished in gauged work; but the latter is a difficult process, for the neat cement takes some time to set and is not sufficiently plastic.

Deflection.

It is not possible by a simple examination to ascertain the strength of a finished structure in ferro-concrete, for the metallic members are no longer visible and their precise size and position cannot be gauged. The only method is to measure the deflection of the structure under given loads. The results obtained are, however, not precise, and useful information can only be gained by comparing similar structures. The deflections of structures in ferro-concrete are much less than those which would be given by a structure of equal strength built of wrought-iron; for when concrete is stressed up to its elastic limit its deflection is less than that of iron under similar conditions.

Principles of Construction.

Professor Rabut has summed up in the following six rules the principles which experience and theory recommend should be followed in the construction of ferro-concrete buildings:—

- (1) No connections should be made of iron to iron, as the concrete itself holds the parts together in the most economical manner.
- (2) At least two distinct systems of reinforcement should be used—the one system to take up the tensile stress and the other to take up the shearing stresses in the concrete; when it is necessary a third system should be used to take up the compressive stresses.
- (3) To so arrange the reinforcement that the separate members may be stressed in the direction of the length, so that the stresses produced between the iron and the concrete shall be tangential and not normal to the axis of the members of the reinforcement.
- (4) To profit by all means of increasing the homogeneity of the various parts of the structure. This may be done by prolonging the iron parts of one portion of the structure into the thickness of the concrete of the adjoining portions, at a negligible cost; while the construction of rigid joints in a metallic structure is very expensive.
- (5) On the other hand, advantage should be taken to the utmost extent of the homogeneity thus obtained to economize materials.
- (6) In view of this homogeneity sudden alterations in the cross-section of the parts should be avoided, as the parts tend to assist one another and to distribute the stresses, the constitution of ferro-concrete being, so to speak, democratic.

The component parts of a ferro-concrete structure may be classed under three headings, which the author will examine in turn. They are (1) the parts which resist tensile stresses, (2) those which resist compressive stresses, and (3) those which resist more complex stresses.

Parts resisting Bending Stresses.

These comprise chiefly the beams and the platform beams. In the majority of cases the beam supports a platform which is solid with it, and can therefore be used as a framework in compression; and this is one of the most characteristic properties of ferro-concrete. The beam is therefore really composed of the rib and the part of the platform on each side, and this has a cross-section in

the form of a **T**. The tension member consists of one or of several metal bars embedded in the lower part of the rib.

The materials are therefore used in the most rational manner, the concrete of the platform is subject to compression and the metal resists tension; but this specialization of work is only possible owing to the adhesion of the concrete to the metal. In reality there are forces tending to produce sliding, and these are proportional to the shearing forces, and therefore attain their maximum value near the supports. These forces tend to shear the concrete of the rib and are concentrated at the contact surface of the concrete and metal. The mutual adhesion of these two materials has a very great importance, and it is well to bear this in mind.

Numerous tests have shown that in a carefully-built structure this adhesion is not of lower value than the shearing coefficient of the concrete itself. If, however, the concrete be very poor in cement, or if it has been gauged too dry and insufficiently rammed, then the adhesion may be low and the use of bars of special section has advantages, these bars having projections which prevent all slipping of the metal in its concrete sheath. Such bars are very commonly used in American practice.

It has been stated that the adhesion was illusory, and that in reality the effect was merely due to a high coefficient of friction between the iron and the concrete which compressed it in shrinking. But the fact that beams subject for lengthened periods to incessant vibration, such as those in the floors of flour mills, have remained sound tends to prove that the adhesion is real and lasting. Special tests have always given reassuring results, except when they have been made upon flat contact surfaces; but this is a condition which does not occur in practice, and it is probable that during setting the contraction of the cement produces tangential stresses which destroy adhesion as it is produced. In the case of cylindrical surfaces, on the contrary, this contraction produces compression normal to the axis of the cylinder and therefore favourable.

Adhesion does not only assist in resistance to shearing stresses, but the variations in relative volumes of the two materials in contact must be considered; these variations being caused by change of temperature or by shrinkage of the concrete.

Temperature has no influence, for the coefficients of expansion of iron and concrete are practically the same. When concrete sets in air it contracts, and therefore may produce considerable initial compression upon the embedded metal whilst being itself subject to an equivalent tensile stress. When the concrete sets under water the opposite effect is produced: the concrete expands and puts the metal in tension.

Resistance of the Shearing Stress.

It is important that the shearing stress should neither overcome the adhesion of the metal to the concrete nor shear the rib of the beam. To fulfil the first condition it is necessary to form the metal framework of such a number of bars that their surfaces in contact with the concrete shall be large enough, and

in consequence the chance of surface slips shall be reduced. To avoid shearing of the rib special stirrup-shaped bars are used which join together the two members. It is not correct to state that these stirrups directly resist the shearing stress. In reality, a piece which is under shearing stress throughout its entire length is by that stress subject to bending, but the stirrups have no rigidity and are incapable of resisting any appreciable bending moment; as a matter of fact they fulfil the same purpose as the tension bars in the web of a lattice-girder; the duty of the compression bars is fulfilled by the concrete of the rib. It is therefore obvious that it is essential for the stirrups to be hooked at one end to the tension bar, and that at the other end they should be solidly embedded in the concrete platform. Fig. 1 shows the transverse section of a beam built on the Hennebique system and beside it the drawing of a single stirrup. This stirrup consists of a flat bent bar with the two ends bent in the form of claws, allowing it to hook itself solidly into the floor structure. The use of the flat bar in preference to the round bar facilitates the construction. Fig. 2 represents a cross-section of a beam on the Coignet system. Here there is an upper iron framework. Owing to this it is possible to put the framework of a beam together in advance, and to place it in position entire while holding it by the upper bar. The attachments are made of bars of round iron bent to **U**-section, and the ends are twisted together so as to form an elongated ring. Owing to the presence of the two frameworks the attachment binds the two members together very effectively. The round section is better suited to the concrete than the rectangular form.

Another means of resisting sliding consists in omitting horizontal bars in tension and substituting bars fixed obliquely in the webs and rising to the floor structure at the ends of the beam. In this manner a beam of variable height is obtained approaching more or less closely to the parabolic form, that is to say, the ironwork will be subject to a constant tension upon its entire length, and the shearing stress will be zero, as it is neutralized by the vertical component of the oblique tension in the bar. In this manner, however, the difficulty is only set back a step, for the bar being in tension right up to the ends, must lose it rapidly in a very limited space, whence arises a considerable tendency to slipping, which is met either by opening out the end into a swallow-tail, or, if this is insufficient, by bending the bar upon itself and placing a cross pin in the bend. The simple oblique bar is not used for a beam with free supports.

Stresses near the Supports.

The author has pointed out that one of the characteristics of concrete is to lend itself easily to continuity of structure; but it is clear that this may have the effect of displacing towards the bottom the diagram of the bending moments in such a way that near the supports certain reversed moments may be of higher value than the moment at the centre of the span. From this cause tensile stresses are produced in the top member and compression stresses in the bottom member.

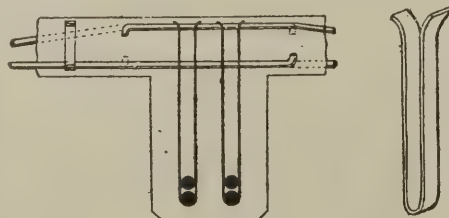


FIG. 1.—SECTION OF BEAM ON HENNEBIQUE SYSTEM.

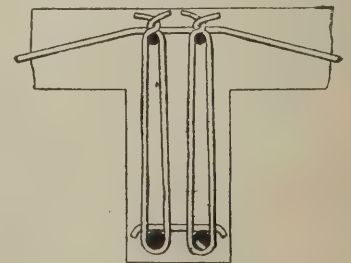
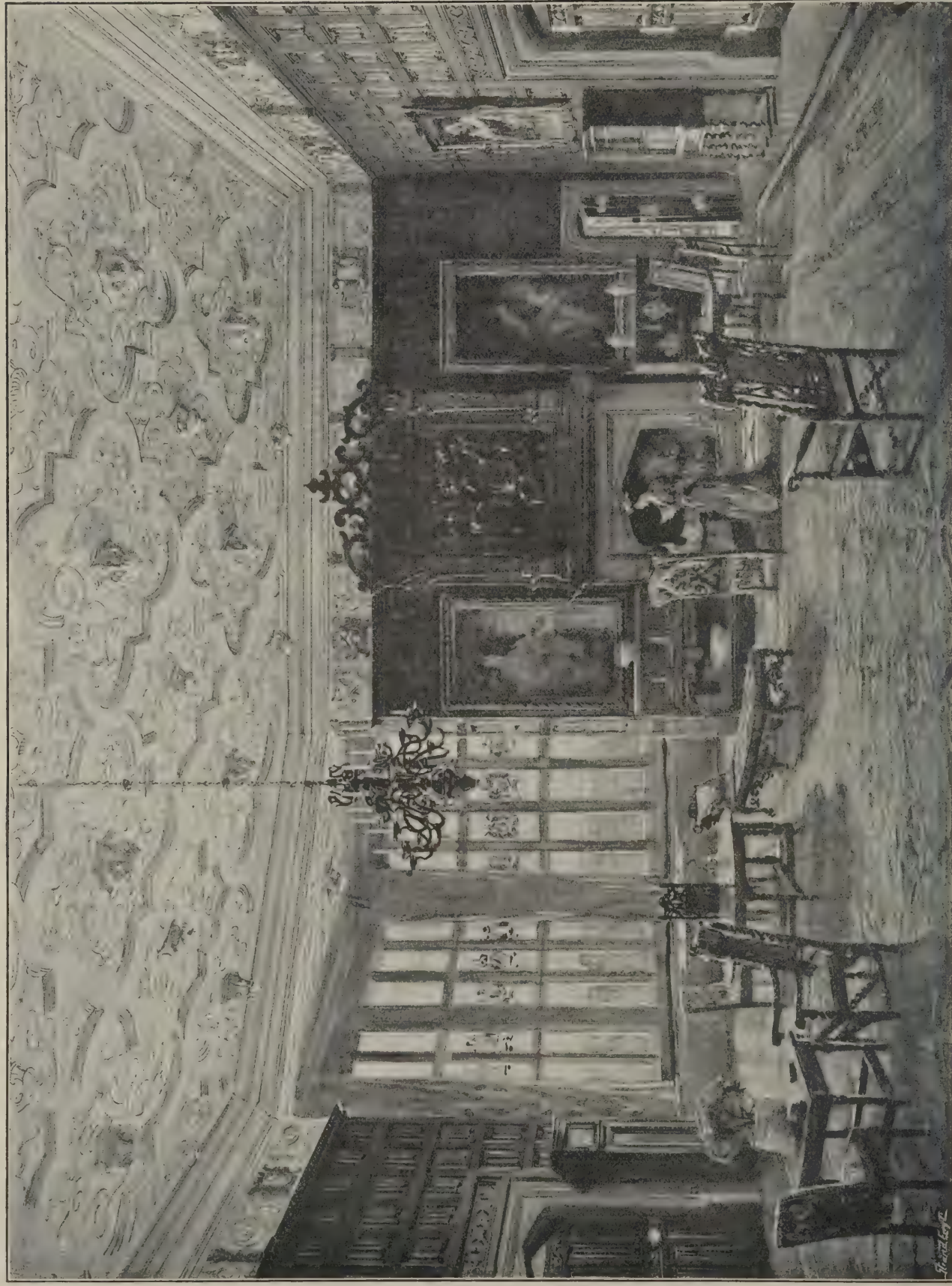


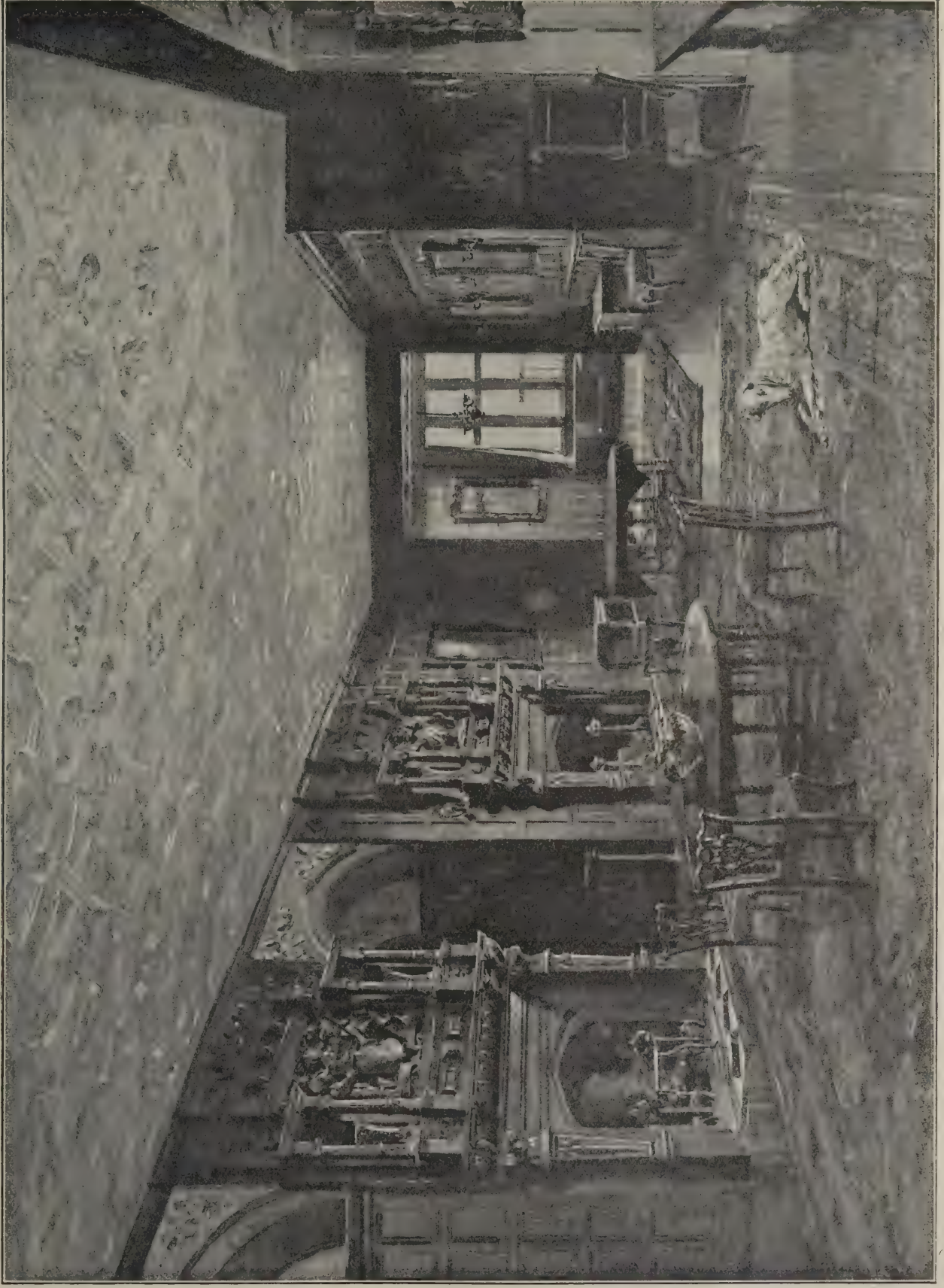
FIG. 2.—SECTION OF BEAM COIGNET SYSTEM.

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OAK DRAWING-ROOM, POWIS CASTLE. G. F. BODLEY, R.A., ARCHITECT.

(Royal Academy Exhibition, 1905.)



DINING-ROOM, POWIS CASTLE. G. F. BODLEY. R.A., ARCHITECT.

(Royal Academy Exhibition, 1905.)

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In order to overcome the first set it is necessary to provide new reinforcement if it does not exist in the upper member, or to raise the lower reinforcement towards the top of the beam, which has also the advantage of neutralizing the tendency to sliding, as has already been pointed out. To overcome the second series the concrete of the lower part of the web is often insufficient, and then the lower reinforcement is used at this point in compression. Another method which is coming into use consists of banding the concrete of the web, which, as will be pointed out hereafter, considerably increases the resistance to crushing.

When the reversal of the moments is due to the continuity of the beam and the floor platform the use of reinforcement in the upper part is not always necessary; in fact, the platform may then play the part of the member in tension, owing to the "distributing" bars which it contains and to the resistance to tractive efforts of the ferro-concrete itself, which will be discussed later.

When the beams have no continuous platform at their upper part they ought to be provided with comprehensive reinforcement or be banded.

Fig. 3 is a longitudinal section of a portion of a beam on the Hennebique system. It will be observed that half the bars composing the lower reinforcement rise to the top at the supports, resisting at the same time the tendency to slide and also the moment of shearing at the junction. The other half keep their position right to the end, where they serve to resist the compression and to support the stirrups.

Fig. 4 represents a portion of a beam built upon the system of Perraud and Dumas. The attachments are formed of a trellis of flat strips bent obliquely between the lower reinforcement and a bar at the top, so that the body of the beam forms one mass of great rigidity which is of value in the erection. The lower ironwork is reinforced in its central part by a bar in order to obtain as nearly as possible a section of canal resistance. This method has, however, the disadvantage of giving a minimum perimeter to the section of the ironwork at the supports, which are precisely the points where it should have its greatest value. At the level of the platform there are bars to resist shearing at the supports and compression bars in the centre.

The author of this paper desires to advocate a simple system which affords a reinforcement of canal resistance and offers every security for resistance to sliding. Fig. 5 shows its application to a beam without fixed ends. For a span of moderate amount the reinforcement consists of bars of three different lengths.

It will be seen that they leave the lower part of the web at determined distances and rise towards the floor structure, where they end in a hook. In these hooks, as well as in the angles formed by bending, there are placed transversely pins *a* and *b*. These pins are of great importance, for they represent the placing, between the oblique parts, of bars which may be considered as the diagonals of the web of a lattice-girder, and the concrete lying between *a* and *b* which is analogous to the compression bars.

The reinforcement of a beam with platform is calculated according to the nature of its central transverse section where the maximum bending moment occurs. As the sliding efforts there are zero, the normal sections remain flat after deformation and merely swing upon the neutral axis. This condition of conservation of the plane sections, combined with the equations of equilibrium of movement and of moments, suffices to determine the forces acting upon the reinforcement. But for this it is necessary to know the law which connects the compression of the concrete to its decrease in length. This law,

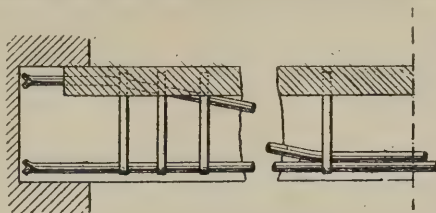


FIG. 3.—BEAM ON HENNEBIQUE SYSTEM.

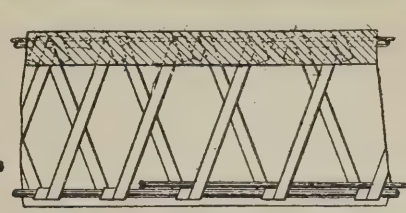


FIG. 4.—BEAM ON PERRAUD AND DUMAS SYSTEM.

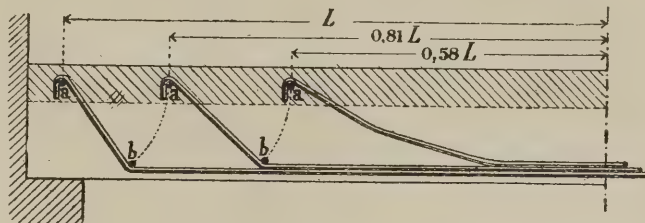


FIG. 5.—BEAM ADVOCATED BY THE AUTHOR.

however, varies within wide limits according to the composition of the concrete, and especially with the manner in which it is used in the work, the degree of fluidity and the ramming. Moreover, the law is not linear and is greatly affected by hysteresis, so that the deformation is a function of the duration of the compression and of the former life history of the concrete so far as stresses are concerned. Yet when the height of the beam is great relatively to that of the floor platform the variation of the law of deformation of the concrete does not sensibly affect the forces acting upon the reinforcement, and the section of the latter may be calculated with sufficient accuracy.

It should be noted that the elements of the floor platform which constitute the reinforcement in compression have an efficiency which diminishes as their distance from the web increases and as the length of the beam decreases.

The Floor Platform.

When in a beam of T-section the part of the concrete in tension in the web has merely an insignificant influence and may be neglected, it is desirable to enquire if it is not the same with the concrete in tension in a floor platform which has a section larger than that of the concrete under compression. M. Considère has shown that ferro-concrete can extend without cracking until the reinforcement reaches its limit of elasticity, and that the part of the resistance due to the concrete attains after the first extensions a value which remains constant until rupture occurs. It is evident that if this result is to occur the piece must be free from all cracks before the test, and to obtain this condition special precautions must be taken in its manufacture and setting. Excess of water must be avoided in gauging, ramming must be carefully done, and the piece must be kept moist during the first days of setting.

In practice these conditions are never fully realized, and therefore the rapid shrinkage of the cement produces premature tensile stresses which cause hair cracks. But these cracks never affect any great depth of the floor structure, and many contractors think that one may therefore count upon almost the whole of the concrete in tension to relieve the reinforcement; others, on the contrary, believe that it is always dangerous to count upon this aid.

The tension of the reinforcement of a platform will also vary with the law of deformation which it may be thought desirable to apply to compressed concrete, a law which is all the more uncertain as concrete is not homogeneous; in fact, the last layer of concrete is not generally rammed so as to facilitate levelling. It is therefore obvious that the theoretical calculation of floor structures can only have a relative value, and

that the coefficients which are used in these formulæ ought to be obtained from practice. This uncertainty in calculation is, besides, often hidden by the want of precision with which the reinforcement can be fixed in the thickness of the platform.

Like the beams, the platforms are very often fixed or continuous, and this condition requires reinforcement in the upper layer, or in a simpler manner by the raising of the lower reinforcement near the supports (Fig. 2).

With respect to resistance to sliding, as the perimeter of the section of the reinforcement is almost always less than the width of the platform it is useless to provide stirrups. Besides the principal reinforcement, there are placed immediately above it, and in a perpendicular direction, some "distributing" bars which are intended to interlace with several of the principal bars and offer a better resistance to a concentrated load. In order to ensure regularity of erection the two systems of bars are sometimes bound together at some of the crossing points by means of iron wire.

When it is a question of covering a surface approximately square—a case which occurs frequently in houses—there is a great advantage in making the two systems of bars of equal strength so as to make use of all four sides of the space as supports.

The uncertainty of the conditions of stress upon the reinforcement which is so great for the ordinary floor platforms is still more so for the square surfaces referred to above. The reinforcement may be fixed in lines parallel to the sides or parallel to the diagonals: the use of the latter system, which necessitates a large number of different lengths of bars, cannot be justified by any theoretical consideration; a satisfactory system consists in placing the reinforcement parallel to the sides and grouping the bars closer together along the middle of the sides.

A simple and elegant arrangement for surfaces of small dimensions consists in the use of expanded metal as the reinforcement; perfect security is then obtained for the necessary adhesion, and a poor concrete may be employed. This method of construction can be recommended for foundation blocks.

Pieces for resisting Compression Stresses.

Columns are usually made of square section to facilitate centering; as a rule the reinforcement consists of four longitudinal bars placed near the four angles and joined at intervals by cross-ties. The ties are intended to prevent the buckling of the individual bars, and also serve to retain them in position during the filling of the concrete. The cross ties consist of plates or round bars which surround the longitudinal bars. Sometimes they are twisted round each bar, or plates with holes may be threaded upon the bars.

The calculation of the reinforcement is

empirical, for the determination of the strain is first of all affected by the uncertainty regarding the law of deformation of the concrete, since it is directly proportional to the latter. Besides this the shrinkage of the cement communicates to the metal an initial compression which is often very considerable but impossible to value beforehand. Moreover the bars also assist in resisting the tendency to buckling of the entire column, but the buckling is proportional to the coefficient of elasticity of the column, and this value varies with the load and is very different for the same load according as the preceding load has been greater or less than the load under consideration.

The resistance to buckling and to crushing is much increased by the use of a concrete very rich in cement, gauged with only a small quantity of water and well rammed.

The methods of reinforcing concrete against compression have been revolutionized by the introduction of the banded concrete invented by M. Considère.

The very remarkable work of M. Considère has shown that metal employed under the form of bands has, from the point of view of resistance to compression, an efficiency 2.4 times greater than that used in the form of longitudinal reinforcement. To be effective these bands ought to be circular and should not be placed further apart than one-seventh of the diameter of the banded concrete. By submitting the banded pieces to an initial compression or letting them harden under water the bands become also much more efficient than longitudinal bars in resisting buckling. They have also the considerable advantage of being endowed with an absolutely surprising plasticity, which makes a thoroughly sound structure. Warning is also given of excessive compression by the shelling off of the concrete covering the bands long before the structure has reached its safe limit of compression.

The simplest and most economical form of the bands is the spiral. By putting the turns of the spiral closer together it is possible to strengthen certain parts which are under the greatest stress and give a known increase to the strength. It is also possible to reinforce a structure already completed by winding round it an iron wire which is afterwards covered with a layer of plaster. Banded pieces prepared in the workshop with all possible care, and made with a very rich concrete and subjected to initial compression, offer a resistance to compression comparable with that of a structure of riveted steel of the same weight, and are less expensive.

It is safe, therefore, to prophesy that banded concrete will be able in a large number of cases to replace with advantage the compression members made of rolled steel sections in a large metallic structure. The tension members would consist of bundles of round bars lightly banded and dipped in concrete. The connections would be more easily made than those of other frameworks, and could be reinforced by a supplementary banding. Such structures would have an unlimited life with practically no expense for maintenance. In this connection M. Considère has constructed and tested with complete success a bridge of 65.6 feet span entirely built of banded concrete.

An important application of banded concrete has come into ordinary use for piles. Such piles are stronger than those of wood, and have the enormous advantage that they do not rot.

Parts submitted to Complex Stresses.

The most important type of these pieces is the vault, in which the reinforcement is specially designed to resist bending stresses caused by non-symmetrical or concentrated loads, whilst the concrete supports in compression those that are fixed and distributed. The greatest uncertainty exists as to the most rational method of reinforcing a con-

crete vault; the calculation of the reinforcement is only rendered possible by the use of empirical coefficients. For vaults of wide span one observes that different builders follow opposite methods; some, like Hennebique, thinking that the essential character of ferro-concrete is the opportunity which it gives for producing monoliths and of profiting in all cases of possible bonding, form their vaults of a series of ribs in arcs connected at their upper parts by a horizontal platform; the arc has then near the supports its maximum of height and this permits a good bonding with the abutments. Other builders seem to be haunted with the fear of the effect of expansion and of shrinkage, and give to their vaults as much flexibility as possible by making them with a cylindrical lattice-work. In recent years some have gone further in this direction and formed arches with three joints.

As has been seen from the preceding remarks, it is most frequently impossible to determine accurately by means of theoretical formulæ the actual cross-sections of the reinforcement. The best guide is experience translated as well as possible into empirical rules. These rules will be all the more reliable according as they are based upon a larger number of structures, and from this point of view it is best to prefer the systems which have been the most employed in practice.

On the subject of principles of calculation for structures in ferro-concrete it is interesting to cite the opinion of Professor Rabut:—"I often hear it said that structures in ferro-concrete cannot be so accurately calculated as metallic structures; in my opinion the contrary is true; the formulas for metallic bridges are in their principles just as arbitrary and just as far from the expression of the real strains as those of ferro-concrete; but the latter have the advantage of containing twice as many constants, those of iron and those of concrete, which, if these constants are conveniently chosen, will allow of approaching the truth much more nearly.

The author will now briefly describe some types of constructions in ferro-concrete which present interesting features, and will restrict his choice to recent works and those to be found by preference in the neighbourhood of Liège.

Dome of the Central Railway Station at Antwerp.

This dome springs from the level of the roofs of mass of buildings of the station at a height of 130ft. above ground level and rises another 130ft. to the spire. It is entirely constructed of ferro-concrete by the firm of Vasanne of Brussels. The work was originally intended to be built in stone, but it was discovered that the foundations would not carry such a weight, and therefore ferro-concrete was preferred, as it could be built hollow. However, it was necessary to follow minutely the form of the original design, which, rationally conceived for a massive material like stone, often presented serious difficulties of execution in ferro-concrete.

The dome comprises four large glass lights placed upon the sides of a square, and upon these rests the actual dome which in its turn supports a lantern. Each glass light is in the form of a gallery with seven arcades surrounded by an arch of 32.8ft. radius. The arches are framed by an archivolt of 11.5ft. height, which receives at its periphery the haunches of the dome.

The entire structure, which is 1,800 tons in weight, rests entirely upon the columns at the angles of the glass lights, for it was only at these points that a solid support could be obtained. These columns are Y-shaped in the cross-section, which has an area of 10.7 sq. ft., and they are subdivided at the height of the centres of the arches into three beams.

The tail of the Y is extended in the diagonal plane in the form of a thrust block

rising obliquely between the two shells of the dome. Each of the limbs of the Y forms the abutment of the beams in the arch, 8.2ft. high, situated in the archivolt. In the horizontal plane passing through the tops of the archivolts is placed a beam in the form of a flat ring 4.92ft. wide, which is supported at eight equidistant points, which are the four tops of the archivolts and the four ends of the thrust blocks.

This beam serves two purposes—it balances the horizontal reactions due to the obliquity of the thrust blocks, and resists the tensile stress created by the joists of the dome. At the top of each beam of the archivolt are hooked two tie-rods which go down in the two midribs of the arches and extend into the two central columns of the gallery of arcades, and support in its place a horizontal beam hidden in the entablature of the gallery and supporting all the lights; it is obvious, therefore, that all the weight of the latter is supported by the columns.

The dome consists of two superposed shells at a distance apart varying from 3.28ft. to 6.56 feet. The internal shell which forms the ceiling of the entrance hall is completely decorated with sunk-moulded panels; some are round and others square, and they diminish in depth and size progressively from the springing to the summit.

They leave only flat bands on the inside of the shell, and these follow a series of meridians and parallels. A part of these flat bands are formed by a skeleton of joists and trimmers which are supported on the annular beam, and they carry the whole weight of the dome. This skeleton was first erected and served to support the cores which formed the moulds for the panels, and then the latter were filled in with concrete.

The external shell has a uniform thickness of 3.15ins., and it is relieved by six moulded ribs following meridian lines. It is supported upon the internal shell by small distant pieces normal to the two surfaces; this method of support has been chosen to allow as much freedom as possible for the unequal expansion of the shell owing to the rays of the sun striking it obliquely.

The most interesting feature of the construction of the dome of the Antwerp station is that all the mouldings and all the sculptures, which are so numerous and of so many different forms, have been executed by direct moulding, and not, as is usually the case, by rough applications which are trued up afterwards by gauge boards. It would never have been possible to make in wood the numberless moulds which would have been needed for the latter process, particularly as the work had to be done upon surfaces bent often in two directions like the panels of the dome.

M. Vasanne has invented a very ingenious system of moulding. He begins by executing in plaster the model of the sculptures which are to be reproduced in the concrete. He then spreads upon this negative mould a layer of 2ins. to 2ins. thickness of a paste made of sawdust and magnesium oxychloride. This paste hardens rapidly and gives him the desired mould, which is light, strong and can be worked like wood; the same negative mould can be used several times.

Renommée Hall at Liège.

This hall was built entirely of ferro-concrete by the firm of Perraud & Dumas, of Brussels. In opposition to what took place in the design for the dome at Antwerp, the general arrangement, the style and proportions of all the parts of the building were specially thought-out by the architect, M. Jaspar, so as to be the most suitable for construction in ferro-concrete, and in order to use the properties of that material to the best possible advantage. It was desired to oppose the tendency to make concrete merely play the part of a servile imitator of stone by the employment of a

characteristic design which should indicate the nature of the material used.

The principal hall is covered by three cupolas, each 55ft. diameter, placed at a height of about 50ft. above the level of the ground. Each cupola forms part of a sphere which continues in haunches pierced with lights and descending to the corners of the circumscribed square. The intersections of the spheres with the vertical planes passing through the sides of the squares are formed by arched beams which spring from the capitals of short cylindrical columns. The cupolas are 4½ins. thick and are made of concrete composed of cement and clinker finely broken up; they are reinforced by a layer of expanded metal and with a lattice-work of bars. The centering of the first cupola was carried out upon a new design. In order to avoid the great expense entailed by the construction in wood of a spherical centering, a skeleton was built up of iron-work consisting of 16 bars, each 1½ins. diameter, fixed upon the meridian lines like the ribs of an umbrella, and these were interlaced upon parallel horizontal circles by other weaker bars. The whole skeleton was then covered with sheets of expanded metal, which were designed as the first reinforcement, and afterwards the concrete was put on above and below so as to completely surround the expanded metal, which thus acted as its own centering, and it was merely necessary to render the surface up to the required thickness. The bars of the skeleton were then removed and used for the other

ashlar work and to destroy the keystones in the arches, which would have been very unwise. The author of the design, M. Prangey, engineer of roads and bridges, got over the difficulty in a very satisfactory manner by fixing the brackets in pairs opposite one another. The brackets were made independently two months before they were needed; the three round bars, 1½ins. diameter, which formed their reinforcement in tension, were left projecting beyond the concrete about a yard, and the ends were screwed. The brackets were put in position, a pair at a time, by means of two cranes, and as soon as their bases had been entered into the recesses cut in the masonry of the bridge the ends of the three pairs of bars were coupled together by means of three tie-bars which crossed the roadway, and these tie-rods were provided with long sleeves threaded to fit the ends of the screwed bars. In this way each pair of brackets were mutually self-sustaining, and the cranes could leave them fixed. It was merely necessary then to level them up carefully by tightening or slackening the screwed sleeves, and then to pin them permanently in position by running in cement grouting round the ends of the brackets in the masonry. All the tie-bars are embedded in a layer of concrete 6½ins. thick, which extends across the roadway and serves to constitute the gutter to carry off water that percolates.

The platform, which is supported by the brackets, is calculated for a distributed load of 80 lbs. per sq. ft., and was tested up to

arches which form the struts. In the neighbourhood of the keystone, and for about 82ft. in length, the roadway is solid with the vault of the principal span. This vault is 2½ft. thick at the haunches and 1½ft. thick where it dies into the roadway; it diminishes further until at the crown the roadway and arch together are only 1½ft. thick. In the parts adjoining the pier, where the vault is clearly separated from the roadway, the latter is supported by three vertical struts 7½ins. thick; one is the axis of the bridge, and the other two forming solid spandrels. The width of the arch being only 18ft., the sidewalks are carried upon brackets 7½ft. long. The roadway is covered with asphalt, and the sidewalks are paved with artificial stone.

Lead Chambers at the Chemical Works of the Engis Co., Ltd.

This company, under the advice of its managing director, M. L. G. Fromont, who is an engineer, has adopted the system of reinforced concrete for the construction of various foundations and for the construction of tunnels, cellars, platforms, hoppers, silos, frameworks for lead chambers and for various powers, such as are required in the Glover and Gay Lussac processes. Among the interesting applications should be specially mentioned the framework for lead chambers.

It is known that the most modern constructions designed to shelter and support the lead chambers are essentially composite structures, generally made of brick in the lower portion and in iron and wood for the upper portion. The combination and connection of the various heterogeneous parts presents many weak points for attack either by the sulphur gas or by sulphuric acid when an accident has happened. Besides this, the enormous quantity of wood used for this kind of structure makes them highly combustible and exposes the manufacturer to serious risks. These disadvantages alone suffice to justify the use of ferro-concrete, and the structure built at Engis, from designs prepared by M. Faure under the guidance of Prof. Henri Deschamps, constitutes really a monolith from the foundations to the summit without joints or discontinuity.

From the point of view of resistance to gas and acid liquids the composition and treatment of the concrete has been the subject of special study, and the mixtures employed have given perfect satisfaction.

The structure occupies in plan an area 230ft. long by 92ft. wide; it has a total height of 82ft., of which 23ft. is for the lower portion and 59ft. for the upper part. The lower portion is formed of piers placed 16 ft. apart, each consisting of four columns connected at their upper ends by a horizontal girder 92ft. long aided at various points by struts fixed to the base of the columns. The total load carried by the lower structure is about 3,700 tons. At certain points the girders are connected together by joists, and there is a flooring of ferro-concrete which serves as a footway all round.

The superstructure consists of vertical columns 59ft. high, which rise from the ends of each horizontal girder, and besides these there are also columns in the centre of the building. At the upper part all the columns are connected together by horizontal girders with a span of 4½ft., and each of these bears a distributed load of 45 tons. The horizontal connections of these girders form the roof terrace. The columns are solidly connected together by vertical partitions of ferro-concrete, which, in conjunction with various struts, give the desired rigidity to the entire structure. The building was erected in 1900, and since that date has been in constant use and has given no trouble whatever. Owing to the careful distribution of the materials it has not been more expensive to construct than the old unsatisfactory composite buildings.

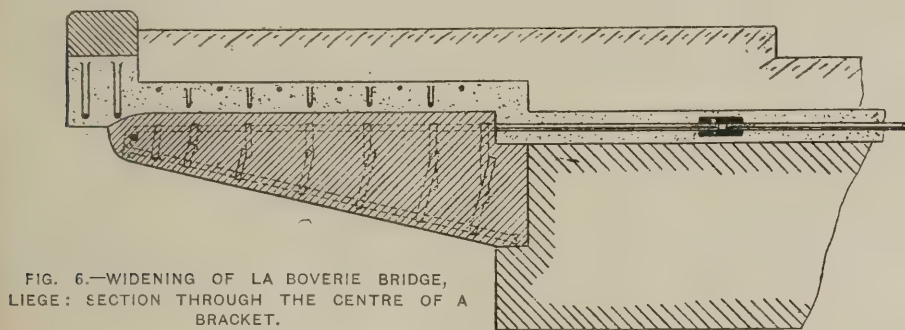


FIG. 6.—WIDENING OF LA BOVERIE BRIDGE, LIEGE: SECTION THROUGH THE CENTRE OF A BRACKET.

cupolas, and they were finally intended for reinforcing the beams. Unfortunately this system of centering was found to be wanting in rigidity, and it was necessary to use the wood centering after all.

The roof of the galleries and the spherical triangles between the cupolas form a terrace of 957 sq. yds. area, which serves as a promenade. The concrete of the cupolas and the terraces is not rendered in cement; it is made watertight by a layer of Ruberoid. The principal hall is lighted upon its two long sides by six semicircular glass lights, each 52½ft. diameter, framed by arched beams. The spandrels are formed by panels of ferro-concrete showing on the inside ornament in relief; the moulding was done in the workshop, and then each panel was cut into portions that were erected in position. In spite of the complete absence of mouldings, which were left out to facilitate the centering, the hall is of most elegant appearance.

Widening of the La Boverie Bridge at Liege.

This bridge is 147 yds. long. The width has been increased from 32½ft. to 46½ft. by means of two platforms corbelled out at each side of the bridge. At each end these platforms are extended so as to meet the quays by wide quadrants.

The corbelling, Fig. 6, is carried out by a platform 5½ins. thick, supported at intervals of 6½ft. by brackets 11½ins. thick, by 10½ins. in height at the back. The method of fixing these brackets is interesting. Cutting and pinning brackets into the old structure presented serious difficulties, as it would have been necessary to cut deeply into the

160 lbs. per sq. ft. without suffering any appreciable deflection.

The Bridge at La Boverie Island upon the Branch at Liege.

This bridge was built upon the Hennebique system by the Dulac Company, under the direction of the engineer, M. Prax. The chief details of the work are: length between abutments 260ft. comprising a central span of 180ft. and two side spans each 32½ft. wide. The total width of the roadway is 32½ft. The span of 180ft. is the full width of the river-bed; the soffit of the arch is an arc of a circle with a rise at the crown of about 12ft., or a proportion of rise to span of about 1 in 85.

One of the special features of the bridge is that it is built upon foundations constructed by a comparatively new process—the method of mechanical compression of the soil. The piers and abutments rest upon a group of concrete piles driven deeply into the bed of gravel, which is strongly compressed by the methods adopted. The piles are reinforced by vertical bars of steel which are continued into the piers and abutments, so that the whole is solidly bound together. The advantage of this method is to solidly root the bridge into the earth, so that it has a resistance amply sufficient in case of a floating accumulation of ice occurring which temporarily transforms it into a dam.

From the point of view of its construction the bridge is considered as a cantilever with unequal arms, the shorter arm balancing the longer by the weight of the abutment. The roadway is a platform of 7½ins. thick and forms a tension member by means of its reinforcement, and it is supported by the

Law Cases.

A Contractor Claims Damages for Delay.

—An important Reference was decided in Edinburgh involving enquiry into work valued at nearly £70,000 in connection with the building of the Colinton Mains Hospital. Mr. James Lownie, builder, sued for £11,140 for extra work, and the Corporation counter-claimed for £3,255, damages for delay. Mr. James Walker, surveyor, was sole arbiter, and there was only one skilled man on each side. The Reference lasted a fortnight. Mr. Lownie was awarded £6,987 8s. 10d., with interest at 5 per cent. from the date of citation. The arbiter's fee is six hundred guineas, his clerk's account £126 1s. 8d., and Mr. Lownie's expenses £578.

Architects' Charges.—At the City of London Court recently Messrs. W. F. Meakin & Son, architects, 6, Martin's Lane, E.C., claimed 25 guineas for services rendered to Mr. F. Binning, 130, Theobald's Road, W.C. The defendant was the leaseholder of certain premises in Rosebery Avenue, and the adjoining owners gave notice to him that certain structural alterations were contemplated under the London Building Act. The plaintiffs were employed to look after his interests, and now they claimed payment. The defendant had paid 15 guineas into court, and said that the charges were excessive. Judge Rentoul found for the plaintiffs. The defendant was non-suited on a counterclaim.

An Architect's Claim.—The case of *Ford v. Nedas* was heard recently by Judge Edge at the Clerkenwell County Court. Mr. Solomon Ford, A.R.I.B.A., 3, South Square, Gray's Inn, sued Lawrence Nedas, 122, Cannon Street Road, E., for £61 1s. in respect of work done and money expended. Plaintiff prepared plans and rendered professional services as an architect in connection with the structural alterations of defendant's premises at 16, High Street, Gravesend. His charges were 5 per cent. on the amount of the contract, extras and out-of-pocket expenses. The work was done and he gave certificates from time to time, the final one being issued on May 15th, 1905. The amounts paid on the contract were according to these terms, and no exception had been taken to them until after action was brought. Expert evidence for defendant contended that an architect was entitled to 5 per cent. on the cost of the building and not on the cost of the contract, and 2½ per cent. for work provided for in the contract but not executed. After a lengthy hearing the judge said that, according to plaintiff's statement, the claim was based according to the remuneration of the architect's society. If that was so, it was not a question of charging on the contract but on the actual total cost of the works. The rule which said that the remuneration for an architect should be 5 per cent. on the total cost of works executed under his direction meant that whether the contract price was exceeded or reduced he was to have 5 per cent. on that amount. The rules also showed that if the contract price was exceeded he was to have 5 per cent. on any extras. Further, that for work provided for and not done it had been stated that an architect should receive 2½ per cent. That was the basis upon which he (the judge) should hold that the contract rested. His Honour went on to point out that plaintiff prepared plans for covering in a place where a cesspool existed, and such plans the local authority refused to pass. He believed plaintiff must have known of the existence of the cesspool, and so he (the judge) must find that he was not entitled to recover for the plans. He was also of opinion that the charge for colouring the plans was excessive, and, having regard to all the circumstances of the case, he thought the amount paid into Court (£39 15s.)

by defendant was sufficient to meet the whole of plaintiff's claim. Judgement was entered accordingly for the defendant, with costs.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Buildings to Measure at Aberystwyth.

ABERYSTWYTH.—Mr. G. T. BASSETT, A.R.I.B.A., writes: "Referring to the enquiry of 'H. S.' in your issue for June 28th, Llanbadarn Church, one mile from Aberystwyth, mainly Norman but with an Early English porch in a very good state of preservation, would probably afford a suitable subject."

Buildings to Measure on the South-west Coast.

LONDON, W.—J. P. writes: "Will you please name a suitable building such as a small parish church which could be measured within a fortnight for the R.I.B.A. final examination. I should prefer some quiet seaside town on the South-west Coast where one could combine a little pleasure and work during a short holiday."

In Cornwall there is little else but Perpendicular work, and if this country is chosen for your holiday you would do well to make your headquarters at Fowey, which is on the sea and has an excellent church; while it forms a centre for railway excursions to places of architectural interest such as St. Blazey, Bodmin and Padstow, which all contain good examples of ecclesiastical architecture. Falmouth contains a good church and is within easy distance of Penryn and Truro. Good churches are also to be found at Camborne and Redruth, which are quiet towns situated about four miles from the west coast of Cornwall and from one another. St. Briean church would also be suitable for measuring, but it is situated in a very out-of-the-way place near Land's End. Devonshire is richer in Early English work, and one might well combine work with pleasure by visiting Yealmpton or Plymstock both within a few miles of Plymouth and containing examples of Early English churches. St. Mary Ottery, situated about six miles inland from Sydmouth and Exmouth, has a church of the same period. Totnes contains a Perpendicular church, while about three miles from this town stands Darlington Hall, a fine example of fifteenth-century domestic work. Lyme Regis, on the coast of Dorsetshire, offers a good example of Decorated work, and three miles by road from this town is a quiet little place, called Charmouth, which contains a fifteenth-century church. Abbotsbury, near Weymouth, and Warham, near Poole and Swanage, contain Perpendicular churches. A very interesting holiday from the architectural point of view might be made to Somersetshire, making your headquarters at any of the following places:—Axbridge, Cheddar, both containing examples of Perpendicular work, Wales, Glastonbury or Shepton Mallet, which contains an example of Early English architecture. All these towns are inland and are connected directly with one another by rail. Other places in Somerset are Bristol and Brislington, which are about three and a half miles apart and possess Perpendicular churches, and Lympsham is a quiet little town with a Perpendicular church situated near Weston-super-

Mare and a few miles from the coast. Your holiday is short, and it is very easy to underestimate the time required for measuring, so that it would be advisable to get well on with the work before you indulge in pleasure. H. M.

Danger of Settlement due to Drain Trenches.

CANTERBURY.—PRECAUTION writes: "A house is in course of erection (the drains being put in first) where the drain is a distance varying from 2ft. to 7ft. away from main wall and is 3ft. 6ins. below the footings of the basement. The subsoil for a depth of 3ft. is brick-earth and the remainder firm sand, the trenches requiring only ordinary strutting. The height of walls from basement level to roof-plate is 37ft. The basement walls are constructed of cement-concrete 18ins. thick. Is there any danger of settlement if the earth in the drain trenches is thoroughly rammed, or are other precautions necessary?"

It would be advisable to leave struts in at a distance of, say, every 4ft., and in consolidating the soil in the trenches water may be employed.

Removing Paint from Stone Font.

LEICESTER.—BULLDOG writes: "What is the best way to remove paint from an old stone font?"

We suggest the use of "Kompr," a paint remover made by Messrs. H. E. Kershaw, Ltd., of 129-131, Curtain Road, Shoreditch, E.C.

White Matter in Teak.

LONDON, S.W.—F. B. L. writes: "It has been suggested that the white matter seen on one edge of the enclosed piece of teak is some form of arsenic, and that this permeates the wood, although invisible, and is the cause of the irritation of the skin set up when working teak. What is your opinion of this?"

Your informant is wrong in suggesting that the white matter is arsenical. It is apatite, or phosphate of lime which consolidates in the shakes. This is the substance that turns the edges of tools, and it may be the cause of the irritation of the skin set up when working teak.

OUR PLATE.

POWIS CASTLE, the seat of the Earl of Powis, is situated close to Welshpool, and is known by Welshmen as Castell Coch, i.e., the Red Castle, being built of red sandstone. It has recently been placed in the hands of Mr. G. F. Bodley, R.A., for reparation. The castle was previously restored by Sir Robert Smirke. The drawing-room, which we illustrate, retains the old bay-window masonry, but is now panelled in wainscoting throughout, with large chimney-piece to match the elaborate plaster ceiling.

The Bells of St. Saviour's (Southwark Cathedral) require re-hanging.

The Marylebone Borough Council have decided to oppose the Architects' Registration Bill on the ground that if it became law the council would have to employ a registered architect, as no one on the staff could comply with the provisions, and also because they would get a nondescript set of architects who would be able to charge large and unreasonable fees.

Birthday Honours.—The King has made the following appointments:—*Order of Merit*, Sir Lawrence Alma-Tadema, R.A., and Mr. William Holman-Hunt, the distinguished painters; *Baronet*, Mr. S. B. Boulton, head of a firm of timber merchants, of Totteridge; *Knights*, Dr. A. B. W. Kennedy, the distinguished civil and electrical engineer, and Mr. I. Spielmann, the well-known authority on art.

Correspondence.

Competition for Primitive Methodist Orphan Homes, Harrogate.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I agree with every word of "Harlow Moor's" letter in your issue of June 21st, and perhaps the following points will be interesting to the competitors, the majority of whom, I am sure, will agree with your correspondent's letter:—

(1) That the assessor managed to adjudicate upon over thirty sets of drawings in under three hours.

(2) That orders were given for the whole of the plans to be packed up and returned the same evening, and that the premiated designs were actually packed up by noon on the day following.

(3) That certain architects went down to the Primitive Methodist Church, with the object of viewing the drawings, and were refused admittance, and not until a strongly-worded protest was sent to the Rev. J. T. Barkley were the plans thrown open for inspection.

(4) I heard it stated in the Primitive Methodist Church on Tuesday afternoon, June 6th, that the committee did not care for the disposition of the buildings on the site as shown on the premiated block plan, and that they did not intend to adhere to this arrangement.

I think the least an assessor can do is to keep to the conditions issued to competing architects, which has certainly not been done in this case. It would be extremely interesting to hear the assessor's reasons for arriving at his decision.

It is perfectly easy for any architect to rearrange his plans, after having thirty sets of designs to choose from, and I am certain that the work cannot be carried out for the amount given in the conditions, and that to modify the plans will practically require a fresh set of drawings to get anywhere near the figure mentioned, viz., £1,000.

This is distinctly unfair to other architects who have kept to the conditions.—Yours truly, FAIRPLAY.

The Reconstruction of Glasgow Royal Infirmary.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In your issue of June 21st you publish scale elevations and a perspective sketch purporting to show relative dimensions of the proposed reconstruction of Glasgow Royal Infirmary and of Glasgow Cathedral. The scale drawings showing the relative ground levels and height dimensions we may take as being correct; but I wish to call attention to the perspective sketch, which I think fails from want of accuracy to effect its purpose. The object of these drawings, which appeared along with the published protest of the Glasgow Institute of Architects, the Art Club and the Archaeological Society, was to enable the reader to judge at a glance the overpowering predominance of the new infirmary front and the complete dwarfing of the cathedral.

A glance at the scale drawings shows that not only are the ground levels opposite the infirmary higher, but that the wall head and ridge of the infirmary are also much higher than those of the cathedral.

By the application of the most elementary rules of perspective to the sketch it will be seen that the two ridges almost coincide in height. Therefore I am convinced that the sketch is wrongly drawn. If the cathedral were shown about as much as one-third lower I think it would convey a more correct impression of the relative bulk of the two buildings.

How in such an important protest such an important point should have been overlooked

I am at a loss to understand. Possibly the protestors to save trouble have used the available competition perspective, which would not have been prepared to put the matter in its worst light. But if so, it is a pity that the effectiveness of the protest should have suffered by the want of a little care to make the drawing as correct and as convincing as possible.—Yours truly,

H. D. WALTON.

11, BOTHWELL STREET, GLASGOW.

Stalls and Rood Screens.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Mr. Herbert L. North's remark on p. 337 of your issue for June 14th last that at Conway and Llanrwst churches the choir and musicians were accustomed—until about half a century ago—to make practical use of the rood lofts over their respective chancel screens, needs some qualification. The query naturally arises from this statement, For what period? Certainly they were not built for that purpose. No credited writer upon the subject has ever ventured to make such an assertion. Further, when your correspondent adds, "This was undoubtedly the mediæval arrangement," he drifts hopelessly to sea. Wherever we find an old chancel screen we also find stalls or the record of such having existed in cathedrals and collegiate churches, of course almost invariably returned. True it is that upon particular festivals of the Church the jubé or rood loft was lit by wax candles (an item that frequently occurs entered in old church accounts). Probably musicians performed upon these lofts occasionally, but certainly they did not regularly do so in the Middle Ages. The Epistle, Gospel and Lessons were, some authorities affirm (see Clapton C. Rolfe's "Chancel Screens and Roods" 1876, for instance), read thereupon from a lectern for the edification of the faithful. But that the rood loft was primarily designed simply to carry the three sacred figures, none are disposed to dispute.

Mr. North remarks that a chancel measuring 16ft. by 12ft. could not contain a choir, but this is a mistake. The space quoted affords room for stalls and fronts giving ample accommodation for ten men and twelve singing boys. That would be quite as large a choir as any small village could be expected to raise.

The mention of the rood screens at Conway and Llanrwst churches recall other fine screens with rood lofts in North Wales. That, for instance, amongst them at S. Beuno at Clynog, on the north coast of the long arm of Carnarvonshire stretching westward, and known as the Llyn Peninsula. The screen is a late Perpendicular one of eight bays—groined on the western side only. The massive old stalls still retain their carved subellæ. Again, in the same locality is the church of S. Einion at Llanengan, situated some sixteen miles south-west of Clynog. It is as a building a less imposing fabric than is the latter's church, but possesses a finer and more perfect screen and rood loft. The screen extends across the nave and south aisle co-extensive with both, but the actual rood loft is over the aisle and not over the nave, a peculiarity also seen at Atherington in North Devon, where, however, the loft or gallery is over the north aisle. The western side is plain, the eastern is much ornamented. The returned old stalls, with their miserere exist here east of both screens (the actual choir seats are modern). The nearest station to this church is Pwllheli (eight miles.)

Yet another church that should not be missed is Llanegryn in Merioneth, some four miles (or rather more) from Towyn, a romantically situated and most typical mountain village church. It possesses neither tower nor aisle, and (as also West-country churches generally) has no structural separation between nave and chancel. It possesses,

however, a superb rood screen. In the upper oak beam of this screen may still be seen about a dozen holes, into which the ancient sconces for candles used to be fixed.—Yours truly,

HARRY HEMS.

FAIR PARK, EXETER.

Competitions.

Islington Central Library.—Mr. John Belcher, A.R.A., has selected the design of Mr. Henry T. Hare for this building from eight designs submitted.

Guildford Housing Scheme.—The town council have awarded the first premium of £20 to Mr. T. J. Capp. Messrs. Clemence & Moon and Mr. A. J. Sturges were the other competitors.

In the High Wycombe Schools Competition Mr. Arthur T. Greenwood, of Gorton, Manchester, was placed first; Mr. C. Harold Norton, of London, second, and Mr. Frank W. Mee, F.R.I.B.A., of Manchester, third.

Harrogate Infirmary.—The assessor in this competition—Mr. G. B. Bulmer, F.R.I.B.A.—has awarded the first premium of £25 to Messrs. H. E. & A. Bown, the second of £15 to Messrs. Bolshaw & Stevens, and the third of £10 to Mr. T. E. Marshall (all of Harrogate).

A Welsh Chapel.—In a limited competition for a new Welsh C.M. Church at Trefriw, North Wales, the committee have selected the design submitted by Mr. G. Dickens-Lewis, architect, of Shrewsbury. The work, which is estimated to cost £3,500, is to be proceeded with immediately.

Obituary.

Mr. E. Thomas, builder, of Worthing, died recently.

Mr. C. H. Jones, slate merchant, Enfield, shot himself recently on the Kemp Town golf links.

Mr. Isaac Lawrence, a well-known builder, of Wareside, near Ware, has died as the result of a cycling accident.

Mr. Charles Walker, of River Bank Mills, Preston, died recently. He was president of the Master-Builders' Association, and a member of the Walton-le-Dale Urban Council. He was head of the oldest building firm in North Lancashire, and undertook many important contracts, including the extensions of the County Offices, rebuilding the Theatre Royal, the Home for the Poor, Fulwood, the Poor-Law Schools, the Church of the Sacred Heart, Ashton, Larkhill Convent and churches at Skerton and Morecambe.

Builders' Notes.

A New Firm.—Messrs. Madley & Perry have started at Pengam, Cardiff, a business as builders and contractors.

The Nottingham Building Trade is stated to be at a very low ebb. Close upon 300 trade-unionist bricklayers are reported to be out of work and over 200 joiners are on the funds of their union. Many of the men have obtained work as harvesters.

The London Building Trades Conference held a meeting recently at St. Pancras Town Hall, Pancras Road, N.W. It was reported that the new suggestions of the London Master Builders Association for the future government of the building industry had been received, but not considered. Addresses were given by Alderman D. Hennessey, Mr. W. Lovatt and Mr. Davenport.

Keystones.

A Viaduct over the River Gaunless, on the North-Eastern Railway, is being constructed.

The Paris Municipality has purchased the contents of the studio of the late Jules Dalou, the well-known sculptor.

The South Parade Pier, Southsea, is proposed to be reconstructed. Its length will be increased to 625ft. and its width to 145ft.

A Stained-glass Window has been placed in the north aisle of Powderham Church. It was erected by Messrs. Drake & Sons, of Exeter.

An Extension of the Liverpool Docks is proposed at an estimated cost of £4,027,500. Considerable shedding is included in the scheme, which contemplates the utilization of 46 acres of water.

The Central Station, Glasgow, has been enlarged and provided with new lavatory, bath, dressing and hair-dressing rooms. The work was designed and carried out under the supervision of the Caledonian Company's engineer-in-chief, Mr. D. A. Matheson.

The Foundation Stone of the new Buildings of the University College of South Wales and Monmouthshire, at Cardiff, was laid recently by the Prince of Wales. The college scheme, when carried out in its entirety, will involve an expenditure of at least £290,000. Mr. W. D. Caröe is the architect.

Brixham Parish Church has recently been restored. The altar tombs have been repaired by Mr. C. Shives, of Brixham. The old wooden floor has been removed and the foundations covered with concrete, over which the aisles have been paved with Purbeck stone, the choir stalls with oak block flooring and the transepts with blocks of pitch-pine.

Harrogate Infirmary is to be enlarged at a cost of between £4,000 and £5,000. Among the additions will be a waiting-room, a new operating theatre, with anaesthetic room, stores and lavatories, &c.; and a ward on the first floor. The number of beds in the infirmary will be increased from forty to fifty-eight, and a number of additional staff bedrooms will be provided near the operating theatre.

A Tibetan Temple has been erected in the Colonial and Indian Exhibition, at the Crystal Palace, as an addition to the series of architectural courts. Around the temple are ranged a number of cases, in some of which are objects of the most sacred kind connected with the Tibetan worship of Buddha. Among them is an actual shrine of Buddha and an extraordinary collection of articles and curiosities illustrative of the life and civilization of the people.

Selly Oak Infirmary.—The King's Norton Guardians have approved plans by Messrs. C. Whitwell & Son for an extension of Selly Oak Infirmary, the erection of a nurses' home, and the extension of the isolation hospital, at a probable cost of between £25,000 and £30,000. The extension will increase the accommodation from 250 beds to 472, and provide new quarters for forty-eight nurses. The plans have been sent to the Local Government Board for provisional approval.

Dundee City Churches are stated to need restoration. Mr. James Thomson, the city architect, has suggested three schemes, namely, to clean and paint St. Clement's Church and clean down and remove loose parts of St. Mary's and St. Paul's Churches, at a cost of £550; to clean and paint St. Clement's Church and repair St. Mary's and St. Paul's Churches with cement, at a cost of £2,800; to clean and paint St. Clement's Church and thoroughly repair and restore with stone St. Mary's and St. Paul's Churches, £7,500.

New Parish Council-Chambers at Irvine have been erected at a cost of £1,500.

Hyde Abbey, Winchester, said to contain the remains of King Alfred, is proposed to be restored.

The National Committee for the Establishment of Sanatoria propose erecting a building at Beveden, Kent, to accommodate 200 patients. The estimated cost is £50,000.

Eastleigh's new Baptist Church, which will cost £3,200, is being constructed of red brick with Bath-stone facings. The architect is Mr. J. Wills, of Derby, and the builders are Messrs. Golding & Ansell, of Southampton.

A Window in Exeter Cathedral has been erected in the chapel of St. Mary Magdalene at a cost of £500. It has been executed by Burlinson & Grylls, and the design and treatment is similar to the great west window, by the same artists.

In East Budleigh Church, Devonshire, the fine carved pulpit designed by Mr. G. H. Fellowes Prynne, F.R.I.B.A., of London, has just had a further figure-group added as a memorial. This has been executed by Messrs. Harry Hems & Sons, of Exeter.

The new Primitive Methodist Schools and Institute at Walkley have been erected at a cost of £3,000. The buildings are faced externally with Dole Hills wall-stone, with stone dressings. Messrs. John Vasey & Sons, of Sheffield, were the builders, and Mr. William J. Taylor, of Sheffield, was the architect.

A Water Tower at Boston, Lincs, has been erected by the waterworks company. The tower is 60ft. high. The tank measures 4ft. 6ins. by 37ft. 6ins. and is 4ft. 6ins. deep, and has an effective capacity of 40,000 gallons. The foundations were put in by Messrs. Langley & Westmorland, of Kirton, and the building erected by Mr. John Lucas, of Boston.

Berwick's Old Fortifications.—An appeal is being made against the proposal of the Berwick Town Council to sell a site for a block of buildings on a part of the ancient Edwardian fortifications adjoining the section recently purchased by the Government. This would, it is stated, necessitate the levelling of the vallum and the filling up of the moat which was constructed by Edward I. and strengthened by King Robert the Bruce.

Bilton Church, Harrogate, has been fitted with a new organ, and new vestries have been added at a total cost of £2,500. The church was designed by the late Sir Gilbert Scott, R.A., and in these new additions his plans for an organ chapel, with choir and clergy vestries, on the north side of the chancel have been followed. The console is in oak and the pipes have been made in "spotted metal" as most fitting to this wood. The organ-builders were Messrs. William Hill & Son.

A new Monastery for the use of the Cowley Fathers and Brothers of the Society of St. John the Evangelist has been erected in Great College Street, Westminster, at a cost of £17,000. The building is of red brick. On the left of the porch outside the grille are two waiting-rooms for women. Through the main entrance there is waiting-room for men, lay brothers' sitting-room, servery and refectory, a spacious entrance hall leading to the community's door to the chapel, a long corridor and sacristy, and in the centre a staircase. The chapel is yet to be built. The basement contains kitchens, store-room and heating plant, &c. On the first floor are three libraries, another lay brothers' room and the Father Superior's study and cell. Next to the guests' common room is a sacristy, and the oratory over the west end of the chapel. The chapel will have an upper floor and a flat roof. The second and third floors are divided into twenty-three cells.

An Infectious Diseases Hospital at Preston is proposed to be erected at a cost of £20,000.

The Metropolitan Asylums Board propose building new central stores at an estimated cost of £29,000.

A Marble Statue of Queen Victoria, by Mr. Albert Toft, has been erected at Nottingham at a cost of £2,150.

The Commercial Travellers' Schools at Pinner have recently been completed by the addition of a hall and classroom.

It is proposed to bridge the Ouse at Goole at a cost of £22,000. Plans have been submitted by Mr. G. Bohn, M.I.C.E.

The new Parish Church of Kilninian and Kilmore, designed by Mr. McGregor Chalmers, was recently opened. It is Gothic in style.

A new East Window at Chichester Cathedral has been erected at a cost of £650. It was designed by Mr. C. E. Kemp.

Change of Address.—Mr. Arthur Stratton, A.R.I.B.A., architect, has removed his offices to 16, Hart Street, Bloomsbury Square, London, W.C.

The Bronze Statue of Bishop Creighton by Mr. Hamò Thornycroft, R.A., was unveiled in St. Paul's Cathedral by the Archbishop of Canterbury on Saturday last, in the south-east aisle.

Culloden Battlefield has been renovated. Messrs. Ross & Macbeth, architects, Inverness, supervised the work, and the gravestones and surroundings have been dealt with in a sympathetic manner.

Cape Town's new Municipal Buildings (commenced in 1899) have been completed. The main hall, which will accommodate 1,000 people, is 60ft. high, 130ft. long and 6ft. wide, and is elaborately decorated.

In Kingston Public Library a stained-glass window has been erected as a South African memorial. The work was executed by Messrs. James Powell & Sons, of the Whitefriars Glass Works, E.C.

A new Primitive Methodist Chapel at Chester-le-Street is being erected at an estimated cost of £2,200. Mr. C. Groves, of Chester-le-Street, is the builder, and Messrs. Boyd & Groves, of Emmerson Chambers, Newcastle, are the architects.

The new Methodist Church at Dovercourt has been completed. It is Gothic in style, with woodwork of pitch-pine. The cost, including the site, was £1,950. Mr. H. Jolley, of Eltham, Kent, was the architect, and Messrs. Spencer, Santo & Co. were the builders.

The Historic Parliament Hall at Edinburgh, which now forms part of the Court of Session buildings, is to undergo considerable renovation. The hall, which was completed in 1639, was built as a meeting-place for the Scottish Parliament on Estates, and was so used down to the Union in 1707. The renovations proposed include a new parquet floor of oak and teak, the re-decoration of the walls, and the cleaning of the valuable pictures with which they are lined. The work will be carried out under the superintendence of Sir James Guthrie, President of the Royal Scottish Academy.

Dalton's Carnegie Free Library, erected at a cost of £3,000, was recently opened. The exterior is faced with Elliscales limestone with Cumberland freestone dressings, and the interior with stucco and part-glazed tiled dados. The roofs are covered with Kirkby slates; the ground floor is paved with terrazzo and wood blocks; the public rooms on the first floor are covered with cork matting and silent treads to all stone steps; the ventilation is on the so-called "natural" system, and the heating is by low-pressure hot water. Messrs. Ashburner, of Elliscales, Dalton, were the contractors, and Mr. W. Richardson, of Dalton, was the architect.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
July 6	Gainsborough—School	Education Committee	Scorer & Gamble, Bank Street Chambers, Lincoln.
6	Aspatia—Four Houses	—	M. Head, Auctioneer, Aspatia.
6	Glasgow—Treating Decayed Stoneware of Buildings	Corporation... ..	Office of Public Works, City Chambers, 64 Cochrane Street, Glasgow.
6	King's Lynn—Alteration to Workhouse Yard	—	Jarvis & Son, Paradise Parade, King's Lynn.
6	Bermondsey, S.E.—Additions to Casual Wards	Guardians	E. P. Fenton, Guardians' Office, Tooley Street, S.E.
7	Kirkpatrick Fleming—Additions to School	—	Schoolhouse, Kirkpatrick Fleming.
7	Settle—Residence	—	J. Hartley, Architect, Skipton.
7	Totnes, Devon—Stands, Paddock, &c.	—	W. F. Tollitt, 10 High Street, Totnes.
7	Swansea—Alterations, &c., to Market	Town Council	G. Moxham, 39 Castle Street, Swansea.
7	Belgrade—Parliament House	—	Accounts Branch of Public Works Department, Belgrade.
8	Dykebar, near Paisley—Asylum	District Lunacy Board	G. Graham, County Place, Paisley.
8	Pontypridd—House	Danylan Building Club	Evans, Williams & Evans, Pontypridd.
8	Ruabon, near Wales—Offices at School	Education Authority	Headmaster, Ruabon (Cefn) Council School.
8	Quenchwell, near Carnon Downs—Chapel	—	J. Pengelly & Sons, Pengelly's Mill, Algnarnick.
8	Bodmin—Steam Bakery, &c.	Co-operative Society	M. Oliver, Bodmin.
8	Wells—Alteration, &c., to Council-Chambers	Council	E. P. Foster, Cathedral Green, Wells.
8	Sudbury—Sanitary Annexes	Guardians	Workhouse, Sudbury.
10	Radyr, Wales—Alterations, &c., to Golf Clubhouse	Golf Club	W. H. Dashwood Caple, Church Street Chambers, Cardiff.
10	Brynmaur, Wales—Alterations at Police Station	Standing Joint Committee	C. W. Best, County Hall, Brecon.
10	Byfield, Northants—School	Education Committee	Law & Harris, 1 Sheep Street, Northampton.
10	Faversham—School	Education Committee	W. L. Grant, Sittingbourne.
10	Cardiff—Classrooms, &c.	Rev. Gilbert Heaton, M.A.	Vaill & Sun, Architects, Cardiff.
11	N. Sunderland, Northumberland—School	Education Committee	County Surveyor's Office, Moot Hall, Newcastle.
11	Sculcoates, Hull—Square Window to Kitchen	Guardians	T. B. Atkinson, 11 Trinity House Lane, Hull.
11	Newcastle-on-Tyne—School	Education Committee	J. A. Bean, The Moot Hall, Newcastle-on-Tyne.
11	Bethnal Green—Chimney Shaft	Council	Borough Engineer, Town Hall, Bethnal Green, N.E.
11	Clacton-on-Sea—Building to house Fire-escape	Urban District Council	A. R. Robinson, Town Hall Buildings, Clacton-on-Sea.
12	Mansfield—Extension of Laundry, &c.	Guardians	Vallance & Westwick, Mansfield.
12	London, N.W.—Vaccine Station	Commissioners	J. B. Westcott, H.M. Office of Works, Storey's Gate, S.W.
12	Barnsley—Repairs, &c., at School	Education Department	T. Graham, Education Offices, Stairfoot, Barnsley.
12	Llangattock-juxta-Usk, Wales—Alterations to Rectory	Rev. H. G. Corner	W. H. Dashwood Caple, Church Street Chambers, Cardiff.
13	Redruth—Lecture Hall, &c.	—	Sampson Hill, Green Lane, Redruth.
13	Omagh, Ireland—Gallery	—	Omagh District Asylum.
13	Wandsworth, S.W.—Church	Rural District Council	H. L. Butler, Salesian Schools, Surrey Lane, Battersea, S.W.
13	South Mimms—Improvement in High Road	Guardians	W. H. Mansbridge, 40 High Street, Barnet.
14	St. Ives—Alterations to Workhouse	London County Council	Workhouse, near St. Ives.
14	London, S.E.—Boundary Walls, &c.	Education Committee	Superintending Architect's Department, 15 Pall Mall East, S.W.
14	South Brent, Devon—Alteration to School	Burial Board	S. Brent, Council School.
15	Isleworth—Sundry Repairs	—	E. J. Partridge, Bank Chambers, 39 George Street, Richmond.
15	Birmingham—Tramway Depot	Education Committee	A. Rowse, King's Court, Colmore Row, Birmingham.
16	Gainsborough—School	Town Council	Scorer & Gamble, Bank Street Chambers, Lincoln.
17	S. Shields—Slaughter-houses	Commissioners	S. E. Burgess, Chapter Row, South Shields.
18	Ashford—Sorting Office	Urban District Council	Post Office, Ashford.
19	Beckenham—Extensions to School	Education Committee	J. A. Angell, Architect to Education Committee, Beckenham.
19	Leigh-on-Sea—Iron Building	Guardians	J. H. Nicholas, County Offices, Chelmsford.
19	London, N.E.—Alterations, &c., to Board Room	Committee	J. W. Dunford, 1000 Queen Victoria Street, E.C.
21	Nantymoel—Additions to Institute, &c.	Governors	J. M. Williams, Architect, Blackmill.
Aug. 1	Buckingham—New Royal Latin School	Education Committee	Town Hall, Buckingham.
1	Carlisle—School Buildings	Education Committee	A. H. Collingwood, 15 Fisher Street, Carlisle.
5	Sheffield—School	—	Secretary, Education Committee, Education Offices, Sheffield.
No date	Bedale—Schoolroom	—	J. Beck, Carthorpe, Bedale.
"	Bergh Apton, Norfolk—Additions to School	Co-operative Society, Ltd.	A. J. Lacey, 6 Upper King Street, Norwich.
"	Bury—Alterations to Bakery	Building Society	W. E. Gill, Derby Chambers, Fleet Street, Bury.
"	Cockfield—New School, &c.	Phillips & Son	Davidson & Phillipson, Pearl Buildings, Newcastle-on-Tyne.
"	Duffryn Rhondda—Seventy-eight Houses	—	W. B. Jones & Peregrine, Bank Chambers, Port Talbot.
"	Newport—Pulling down and rebuilding George Hotel	—	Swalwell & Havard, Steam Packet Chambers, Dock Street, Newport.
ENGINEERING:			
July 6	Hull—Wells, &c.	Corporation... ..	J. F. Bancroft, Alfred Gelder Street, Hull.
6	Hexham—Sewerage, &c., Works	Rural District Council	J. E. Parker, Post Office Chambers, Newcastle-on-Tyne.
7	Burton-on-Trent—Electrical Equipment	Corporation	Kincaid, Waller, Manfield & Dawson, 29 St. George St., London, S.W.
7	Kilham—Well	Parish Council	J. Fisher, Clerk, Kilham.
8	Nelson, Lancs—Suction Gas Plant	Sewage and Streets Committee	B. Ball, Borough Surveyor, Nelson.
8	Newport, Mon.—Electrical Plant	Electricity Committee	H. C. Bishop, Town Hall, Newport, Mon.
8	Granada, Spain—Two Iron Bridges	—	Provincial Government, Granada.
8	Sleaford, Lincs—Water-supply	Rural District Council	W. B. Marsden, 74 Southgate, Sleaford.
10	Kendal—Hot water Apparatus	Education Committee	C. J. R. Tipper, Lowther Street, Kendal.
10	Brigg, Lincs—Pumping Engines	Urban District Council	A. Atkinson, Brigg.
10	Floors Castle—Water-supply	His Grace the Duke of Roxburgh	Roxburgh Estate Office, Broomlands, Kelso.
10	Kirkby Stephen—Hot-water Apparatus	Education Committee	C. J. R. Tipper, Lowther Street, Kendal.
11	Swansea—Widening Road, &c.	Corporation... ..	Borough Surveyor, 13 Somerset Place, Swansea.
11	London, S.W.—Switchboards	London County Council... ..	County Hall, Spring Gardens, S.W.
11	London, S.E.—Engineering Alterations	Metropolitan Asylums Board	Offices of Board, Embankment, E.C.
11	Cardiff—Motor Fire-engine	Corporation... ..	Chief Constable's Office, Westgate Street, Cardiff.
11	London, S.W.—Roadwork and Plate-laying for Electric Traction on Tramways	London County Council... ..	Engineer's Department, County Hall, Spring Gardens, S.W.
12	London, S.W.—Cables, &c.	Fulham Borough Council	A. J. Fuller, Town Hall, Fulham, S.W.
12	Brussels—Viaduct	Government Railways	Secretary, Government Railways, Brussels.
13	Rotherham—Griststone Culvert	Rural District Council	R. Bradbury, 29a High Street, Rotherham.
14	Earby, Skipton, Yorks—Sewage Tanks	Rural District Council	H. A. Johnson, 15 Exchange, Bradford.
14	Lerwick—Water Pipes	Town Council	G. Cruickshank, Borough Surveyor, Lerwick.
15	Belfast—Heating, &c., Institute	Library and Technical Instruction Committee	S. Stevenson, 83 Royal Avenue, Belfast.
17	Leicester—Laying Mains	Water Committee... ..	J. B. Everard, 6 Millstone Lane, Leicester.
17	West Ham—Electric Lighting, &c.	Education Committee	W. Jacques, 2 Fen Court, Fenchurch Street, E.C.
19	Lisbon, Portugal—Iron Bridge	—	1, a Repartição da Direcção Geral de Obras Publicas Minas.
22	Scalloway, Shetland—Water-supply	—	Jenkins & Marr, 16 Bridge Street, Aberdeen.
24	Antwerp—Heating Apparatus	Commercial Intelligence Branch of Board of Trade	Hotel de Ville, Antwerp.
IRON AND STEEL:			
July 6	Salford—Iron and Steel	Gas Committee	W. W. Woodward, Gas Offices, Bloom Street, Salford.
6	India Office, S.W.—Bridgework... ..	—	Director-General of Stores, India Office, Whitehall, S.W.
7	Cricklewood, Middlesex—Pipes and Castings	Metropolitan Water Board	Office of Board, The Firs, Southern Road, Fortis Green.
7	Clonakilly—Wire	Rural District Council	W. H. Spiller, Clerk to Council, Clonakilly.
8	Cleckheaton—Ironmongery	Urban District Council	J. H. Linfield, Town Hall, Cleckheaton.
10	Barcelona, Spain—Iron Material	—	Junta de Construcción de la Nueva Carcel de Barcelona.
10	London, W.C.—Sluice Valves	Metropolitan Water Board	Office of Board, The Firs, Southern Rd., Fortis Green, East Finchley.
13	Leeds—Pipes	Corporation... ..	C. G. Hensell, Municipal Buildings, Leeds.
17	West Ham—Iron Dustbins	Education Committee	W. Jacques, 2 Fen Court, Fenchurch Street, E.C.
17	Leicester—Sluice Valves, &c.	Water Committee... ..	J. B. Everard, 6 Millstone Lane, Leicester.
PAINTING AND PLUMBING:			
July 6	Salford—Leadpipe, Paints, Brushes, &c.	Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom Street, Salford.
7	Merthyr Tydfil—Painting at School	Urban District Council	G. Jenkins, Clerk of Works, Merthyr Tydfil.
7	Huddersfield—Painting, &c., Tramway Poles, &c.	Corporation... ..	Office of Tramway Manager, Longroyd Bridge, Huddersfield.
8	Rotherham—Paints and Varnishes	Corporation	Tramways Manager, Tramway Depot, Rotherham.
8	Cleckheaton—Oil, &c.	Urban District Council	J. H. Linfield, Town Hall, Cleckheaton.
8	Ebbw Vale, Mon—Painting and Colouring at School	Education Committee	H. Waters, Beaufort.
10	London, W.—Oil, &c.	Ealing Town Council	A. E. Lewis, Electricity Department, Town Hall, Ealing, W.
10	Crigglestone—Painting and Decorating Chapel	—	F. Stephenson, Secretary, Primitive Methodist Chapel and School, Great Cliffe, Crigglestone.
10	Leek, Staffs—Painting Work	Urban District Council	W. E. Beacham, Town Hall, Leek.

Complete List of Contracts Open.—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
PAINTING AND PLUMBING—cont.			
July 10	Sculcoates—Painting of Two Wards	Guardians	T. B. Atkinson, 11 Trinity House Lane, Hull.
" 10	Ipswich—Painting and Decorating Work	Education Committee	E. F. Johns, Thoroughfare, Ipswich.
" 10	Nottingham—Cleaning and Painting Work	Education Committee	F. B. Lewis, Guildhall, Nottingham.
" 12	London, S.W.—Cleaning and Painting Work	Metropolitan Asylums Board	Offices of Board, Embankment, E.C.
" 13	Lambeth, S.E.—Redecorating Premises	Borough Council	H. Edwards, 346 Kennington Road, S.E.
" 14	East Ham—Whitewashing, &c.	Education Committee	Education Office, East Ham.
" 15	Isleworth—Painting Work, &c.	Burial Board	E. J. Partridge, Bank Chambers, 39 George Street, Richmond.
" 17	Bristol—Painting & Colouring at Schools	Education Committee	P. Addie, City Valuer's Office, Council House, Bristol.
" 20	Cork—Redecorating Interior of Church	—	S. F. Hynes, 21 South Mall, Cork.
" 25	Leeds—Painting, &c., Rooms	—	City Engineer's Office, Leeds.
Aug. 28	Gateshead—Cleaning and Painting at Schools	Education Committee	E. J. Harding, Education Offices, Gateshead.
ROADS AND CARTAGE:			
July 6	Blaydon—Paving	Urban District Council	George Symon, Council Offices, Blaydon-on-Tyne.
" 6	Leeds—Paving	Highways Department	City Engineer's Office, Municipal Buildings, Leeds.
" 8	Cleckheaton—Granite, &c.	Urban District Council	J. H. Lingfield, Town Hall, Cleckheaton.
" 10	Heath Town, near Wolverhampton—Street Works	Urban District Council	Berrington & Son, 28 Victoria Street, S.W.
" 10	Leamington—Stone	Corporation	Borough Engineer's Office, Town Hall, Leamington.
" 10	Teddington—Making-up Roads	Urban District Council	M. Hainsworth, Elmfield House, Teddington.
" 10	Croydon—Granite	Guardians	Harry List, Union Offices, Mayday Road, Thornton Heath.
" 12	Wembley—Making-up Roads	Urban District Council	C. R. W. Chapman, Public Offices, Wembley.
" 12	Fulham, S.W.—Making-up Carriageway	Borough Council	F. Wood, Town Hall, Fulham.
" 17	Devonport—Street Cleansing, &c.	Corporation	R. J. Fittall, Town Clerk's Office, Devonport.
" 17	Paignton—Widening, &c.	Urban District Council	C. O. Baines, Town Hall, Paignton.
" 17	West Ham—Terrazzo Paving	Education Committee	W. Jacques, 2, Fen Court, Fenchurch Street, E.C.
" 18	Luton—Stones	Rural District Council	B. B. Franklin, 21, Market Hill, Luton.
SANITARY:			
July 6	Blaydon-on-Tyne—Scavenging	Urban District Council	R. Biggins, Sanitary Inspector, Council Offices, Blaydon.
" 7	Maryport—Ash-cart	Urban District Council	Council Surveyor, Town Hall, Maryport.
" 8	Cleckheaton—Carbolic Powder, &c.	Urban District Council	J. H. Linfield, Town Hall, Cleckheaton.
" 8	Swalwell, Durham—Sewer	Urban District Council	J. B. Renton, Council Offices, Whickham.
" 10	Dalton-in-Furness—Drainage Works	Education Committee	W. Butler, Elementary Education Offices, Dalton.
" 10	Haddington, N.B.—Sewers	Town Council	Leslie & Reid, 72A George Street, Edinburgh.
" 10	Croydon—Redrainage and Plumbing Work	Guardians	H. Berney, 104, George Street, Croydon.
" 14	Grassington, near Skipton, Yorks—Sewers, &c.	Rural District Council	H. A. Johnson, 15, The Exchange, Bradford.
" 15	Prospect—Sewerage Works	Cockermouth R.D.C.	J. B. Wilson 11, Main Street, Cockermouth.
" 17	Devonport—Street Cleaning, &c.	Corporation	R. J. Fittall, Town Clerk's Office, Devonport.
" 19	Middleton—Sewer	Corporation	W. Wellburn, Borough Surveyor, Middleton.
" 31	Hawarden, Flints—Sewerage Works	Rural District Council	E. S. Taylor, 26, Newgate Street, Chester.
TIMBER:			
July 6	Salford—Timber	Gas Committee	W. W. Woodward, Gas Offices, Bloom Street, Salford.
" 8	Rotherham—Hardwood Brake Blocks	Corporation	Tramways Manager, Tram Depot, Rotherham.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
July 8	Drogheda—Furnishing Library	—	—	J. B. Connolly, Hon. Secretary, Public Library Committee, Drogheda.
" 27	Bexhill, Sussex—School	£50, £30 and £20	£1 IS.	Secretary, Education Committee, Amherst Road, Bexhill.
Aug. 1	Hove, Sussex—Library	£50, £30, £20	£1 IS.	H. Endacott, Town Hall, Hove.
" 1	Perth—Reconstruction of Hall... ..	30, 20 and 10 guineas	—	J. Begg, City Chambers, Perth.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

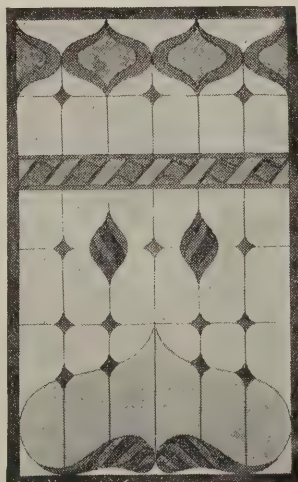
RURAL BY-LAWS.

THE Public Health Acts (Amendment) Bill, which has been referred to a Select Committee of the House of Lords, is designed to facilitate the erection of cottages and small houses, especially in country towns and rural districts, where the want of accommodation for workmen and labourers is acutely felt, and at the same time to free other houses with plenty of land round them from the restrictions imposed by the existing by-laws. Mr. Justice Grantham, giving evidence before the Select Committee, recently said the model by-laws were a vast improvement on the old by-laws, but, strange to say, they were so drafted as to be absolutely inconsistent with their intention in certain parts. The Local Government Board ought to take power to amend their by-laws or to withdraw them. With regard to the main principle of the Bill, exempting cottages with sufficient space around them from the operation of by-laws as to structure, he thought that, considering that in the London by-laws there was this provision, it was extraordinary that it should not be given in the country. Such exemption would practically provide for the main difficulties which now beset the landowner desirous of providing accommodation for rural labourers. He strongly urged that power of appeal should be given against orders of the rural district council before those orders could be enforced or proceedings taken before a court of summary juris-

diction. The appeal should be to the county council. The relief from the necessity to furnish plans which the Bill would afford would be of great value. Sir W. Grantham added that many of his own friends to his own knowledge intended to build, but

declined when they found the worry they would have to undergo by the irritating provisions of the existing by-laws. Many small builders had, he knew, been stopped by them, while many had been almost ruined by them.

"CLOISONNE GLASS"



A decorative material transparent and opaque. ✿

Production 1904—
17,000 square feet.

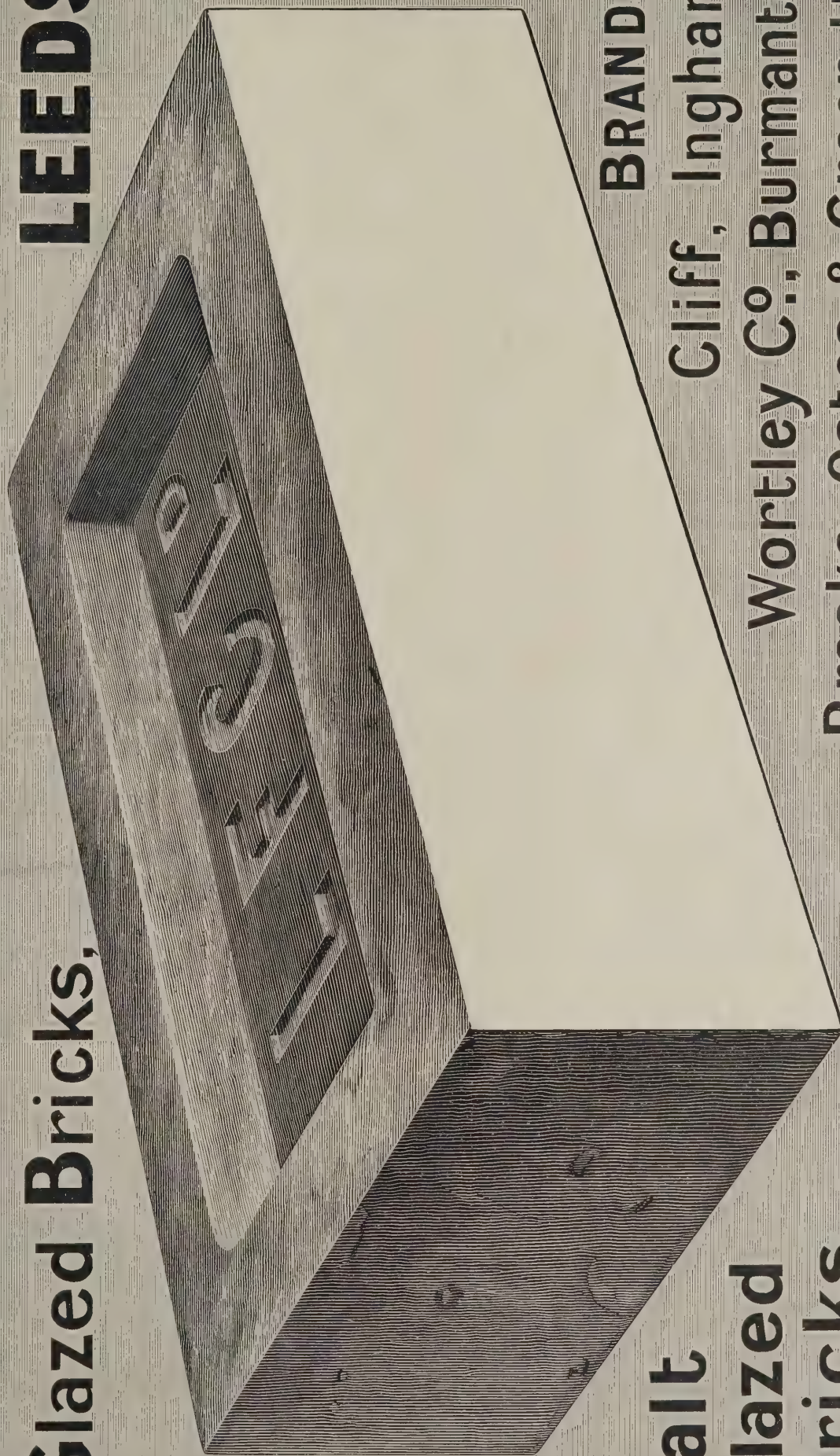
The
CLOISONNE GLASS
CO.

9^E Berners St., Oxford St.,
London, W

Prices from 3/- per square foot.

THE LEEDS FIRECLAY CO., LTD. LEEDS.

Glazed Bricks,



Salt
Glazed
Bricks.

BRANDS:-

Cliff, Ingham,
Wortley Co., Burmantofts
Brooke, Oates & Green Ltd.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barnard Castle.—Accepted for alterations and additions to Mason's Drug Stores, 8, Horse Market, Barnard Castle. Mr. T. Farro, architect, 7, Market Place, Barnard Castle:—

Mason and bricklayer—J. Scott, Barnard Castle.
Joiner and shopfitter—J. Hunter & Sons, Barnard Castle.

Brierley Hill (Staffs).—For altering and improving the town hall, for the urban district council. Mr. J. Lewis Harper, surveyor:—

F. W. Male £1,500
Jakeman & Round 1,430
Oakley & Coulson 1,327
C. A. Hoxton, * Brierley Hill 1,288
G. H. Allen 1,278
A. & S. T. Bishop 1,268

* Accepted.

Chester.—For sewerage, preliminary road formation, edging and channelling in connection with the laying-out of a building estate. Mr. John Little, engineer, Viaduct Chambers, Carlisle:—

S. Hutton, Stamford Road, Bowdon £2,910 13 2
J. Hynes, Ash Grove, Shotton... 2,889 5 6
J. Allan, Halton View, Widnes ... 2,573 2 6
Bennie & Thompson, 80, Liverpool Road, Wolverhampton 2,467 13 6
J. Owens, 8, St. Mark's Road, Wolverhampton... .. 2,462 4 9
R. C. Brebner, 4A, St. Andrew Square, Edinburgh 2,458 0 0
T. Lowe & Sons, Curzon Street, Burton-on-Trent 2,396 18 4
J. W. Harris, Shrewsbury... .. 2,385 0 0
Bullen Brothers, 49, Almond Street, Liverpool 2,361 10 0
Davies & Co., 63, Oseton Road, Birkenhead 2,315 7 10
J. Johnson, Aldcliffe Road, Lancaster 2,292 18 1
Reid & Son, Victoria Avenue, Llandudno 2,257 3 9
Snape & Sons, * Boardman Street, Eccles 2,083 19 10
B. Oxley, Little Sutton, Cheshire ... 2,058 19 10

* Accepted.

Croydon.—For the erection of a detached house in Coomb Road. Mr. Spencer W. Grant, A.R.I.B.A., architect, 63, Finsbury Pavement, E.C.:—

Baldwin Brothers, Croydon £1,345 0 0
Truett & Steel, Thornton Heath ... 1,224 0 0
A. B. Wiles, Redhill 1,168 0 0
J. Long, * Earlsfield 1,098 10 0

* Accepted.

Hounslow.—For the erection of three shops in High Street. Mr. W. A. Davies, A.M.I.C.E., architect, County Chambers, Hounslow. Quantities supplied:—

J. Doney & Son, Brentford £3,073
E. W. Dawson, Fulham 2,920
Wisdom Brothers, Isleworth 2,875
C. Pope, Hounslow 2,875
W. Irwin, Islington 2,868
A. & B. Hanson, * Southall 2,766

* Accepted.

Kinnersley (Herefordshire).—For alterations and additions to Kinnersley Castle, Herefordshire. Messrs. Groome & Bettington, architects and surveyors, Palace Chambers, Hereford:—

First contract.

W. Rowberry £1,434 10 0
Beavan & Hodges 1,213 0 0
R. Morgan, Kingston 1,200 0 0
W. P. Lewis & Co. 1,190 0 0
Davies & Co. 1,112 0 0
W. Bowers & Co. 1,102 0 0
Charles Cooke 1,076 0 0
E. W. Wilks 1,031 0 0
William Powell* 1,017 0 0
J. C. Vaughan 957 0 0

* Accepted.

[Rest of Hereford.]

London.—For the execution of (a) boiler and engine work and (b) laundry and kitchen engineering work at the Southern Hospital, for the Metropolitan Asylums Board:—

Boiler and engine work.

W. J. Fraser & Co., Ltd., London £8,695
E. Danks & Co. (Oldbury), Ltd., Birmingham 8,590
Moorwood, Sons & Co., Ltd., London ... 8,020
Lea, Son & Co., Shrewsbury 7,785
J. & F. May, London 7,698
Rosser & Russell, Ltd., London... .. 7,659
J. Simpson & Co., Ltd., London... .. 7,584
T. Potter & Sons, Ltd., London 7,249
Wenham & Waters, Ltd., Croydon 7,203
Hill & Herbert, Ltd., Leicester 7,040
Death & Ellwood, * Joseph Street, Leicester 6,492

[Engineer-in-chief's revised estimate, £7,800.]

Laundry and kitchen engineering work.

T. Cudlipp, 8, Church Street, Edgware Road 6,414
Clements, Jeakes & Co., 51, Great Russell Street, Bloomsbury, W.C. 4,450
J. & F. May 4,095
Rosser & Russell, Ltd. 4,065
J. Simpson & Co., Ltd. 3,635
Lea, Son & Co. 3,593
Moorwood, Sons & Co., Ltd. 3,515
Wenham & Waters, Ltd. 3,398
Hill & Herbert, Ltd. 3,370
Death & Ellwood 3,275
T. Potter & Sons, Ltd.* 3,249

[Engineer-in-chief's estimate, £4,200.]

* Recommended for acceptance.

London, N.—For the erection of parish hall, classrooms, &c., in Braemar Road, Stamford Hill, for the Building Committee. Mr. Spencer W. Grant, A.R.I.B.A., architect, 63, Finsbury Pavement, E.C. Quantities by Mr. C. W. Brooks, F.S.I.:—

J. Parren & Son, Earith, Hunts £4,823
R. Brown, Clapton 4,513
W. Silk & Son, Hemerton 4,427
W. King & Son, Westminster 4,054
Barrett & Power, Hackney 3,997
J. Stewart, Tottenham 3,976
W. H. Hyde, Norwood 3,953
A. Porter, Tottenham 3,925
Turtle & Appleton, Clapham Junction ... 3,880
Pollard & Brand, Tottenham 3,868
A. E. Symes, Stratford 3,850
G. Parker, Peckham 3,835
Sheffield Brothers, London 3,787
H. Knight & Son, Tottenham 3,767
Truett & Steel, Thornton Heath 3,750
C. Castle & Son, Clapton 3,750
A. Monk, Edmonton 3,700
Todd & Newman, Hackney 3,669
W. Calnan & Son, London, E. 3,575
A. G. Crisp, Walthamstow 3,527

London, S.W.—For alterations, additions, repairs, sanitary work and new caretaker's house, &c., at Westminster Chapel, Buckingham Gate, S.W., for the Trustees. Mr. W. J. Kemp, architect, 6, Bloomsbury Square, W.C. Quantities by Mr. W. E. Stonner, 90, Cannon Street, E.C.:—

J. Lidstone & Son £5,881
Bywaters & Sons 5,632
Stanley, Bird & Co. 5,299
Higgs & Hill 5,198
H. L. Holloway 5,140
J. Carmichael 5,115
Holloway Brothers 5,048
M. Patrick & Son 4,932
Holliday & Greenwood, * Ltd. 4,926

* Accepted.

Accepted for—

Heating and ventilation to the chapel and school buildings.
Wenham & Waters, Ltd. £1,101
Repainting and decorating the interior of chapel, &c.
A. Searle & Co. £1,074
Sundry day-work to chapel, &c.

A. Dent —
Additions to the electric lighting,
Bullman & Dales £200

Ludlow (Salop).—For the erection of sixty loose-boxes, boys' dormitories, canteen, &c., for the Ludlow Race Club. Mr. J. Butters, architect, Ludlow:—

Collins & Godfrey £4,498 0 0
Bevan & Hodges 4,158 0 0
H. Lovatt, Ltd. 3,996 0 0
W. Bowers & Co. 3,948 10 0
C. Cooke 3,750 0 0
W. Bryan 3,331 5 0
Turford & Southward* 3,262 0 0

* Accepted. [Architect's estimate, £3,300.]

Mullingar.—For additions to Dysart Church, Mullingar, for the Rev. C. Casey, P.P. Mr. W. A. Scott, A.R.I.B.A., M.S.A., M.R.I.A.I., architect, 74, Hollybank Road, D. umcondra, Dublin:—

Charles Doyle, Mullingar £963
P. Hanway, Dublin 735
M. Lynam, Milltown Pass 733

Poole.—For the erection of a new elementary school, Oikdale, Poole, for the Education Committee. Mr. Walter Andrew, architect, Parkstone. Quantities by the architect:—

Wilkins & Son, Bristol £4,638 0 0
Chincher & Co., Parkstone 4,387 0 0
Wort & Wey, Salisbury 4,326 14 0
Jenkins & Sons, Bournemouth... .. 4,232 0 0
Erwood & Morris, Bath 4,088 0 0
Miller, Bournemouth 3,941 2 8
George & Harding, Bournemouth ... 3,928 0 0
F. Hoare & Sons, Bournemouth 3,866 0 0
Jesty & Baker, Portland 3,824 10 0
Burt & Vick, Poole 3,797 10 0
W. J. Cross, Parkstone 3,785 12 5
Baker & Percy, Parkstone 3,736 0 0
S. Brown, Bournemouth 3,724 0 0
A. & F. Wilson, Parkstone... .. 3,688 10 0
W. W. Leach, Paignton 3,683 0 0
A. J. Colborne, * Swindon 3,570 16 8

* Accepted

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending June 30th fourteen failures in the building and timber trades in England and Wales were gazetted.

H. GREGORY, builder, Woburn. Adj. June 22nd.
H. GRIFFITHS, builder, Seacombe. R.O. June 23rd.
T. TURNER, street contractor, Hull. Adj. June 22nd.
T. EMSDEN, builder, Ipswich. Adj. June 19th.
W. H. & J. HITCHENS, painters and decorators, Penzance. Adj. June 24th.
G. L. SHEPHERD & Co., builders' merchants, Bournemouth. Adj. June 19th.
W. J. MORSE, varnish manufacturer, Shoreditch. R.O. June 21st.

WALLEY & SONS, builders and contractors, Wolstanton (late Stoke-on-Trent). Adj. June 22nd.
F. HOLGATE, painter and decorator, Calverley. Adj. June 20th.

W. RILEY & Co., timber importers and sawmill proprietors, Bridgend (late of Cardiff).

J. GODFREY, late builders' merchant, Tipton. First meeting, O.R.'s, Dudley, July 1st, at 11. P.E., Dudley C.C., July 18th, at 11.

J. M. STRATTON, builder, Verwood. First meeting, O.R.'s, Southampton, July 7th, at 3. P.E., Town Hall, Poole, Aug. 2nd, at 11.30.

C. FARLEY, builder, Acton. First meeting, 14 Bedford Row, W.C., July 3rd, at 3. P.E., Brentford Town Hall, July 7th, at 12. Adj. June 17.

W. S. GOODERSON, builder and joiner, Eastcote, near Pinner. First meeting, 14 Bedford Row, W.C., July 3rd, at 12. P.E., St. Albans C.C., July 25th, at 10.30.

W. ELSDON, builder, Clapham Park. First meeting, 24 Railway Approach, London Bridge, S.E., July 7th, at 12.30. P.E., Wandsworth C.C., July 20th, at 12.

J. M. KLENCK & Co., auctioneer, surveyor and assessor, London, E.C. R.O. June 14th. First meeting, Bankruptcy Court, July 10th, at 11. P.E., Bankruptcy Court, July 21st, at 11.

W. SMITH, plumber and sanitary engineer, Smethwick. First meeting, 191 Corporation Street, Birmingham, July 5th, at 11. P.E., West Bromwich C.C., July 13th, at 10.30.

ROOFING SLATES:

Velinheli, Penrhyn, and Westmoreland.

SLATE SLAB GOODS:

Both Plain and Enamelled.

ALFRED CARTER & CO., LIVERPOOL.

LIGHT & DARK SEA GREEN STONE,
MOTTLED GREEN STONE,

For Mullions, Sills, Heads, Quoins,
Jambes, Fenders, &c.

Buttermere Green Slate and Stone Works,
KESWICK.

BIRKBECK BANK

ESTABLISHED 1851.

Current Accounts. 2% Interest allowed on minimum monthly balances when not drawn below £100.

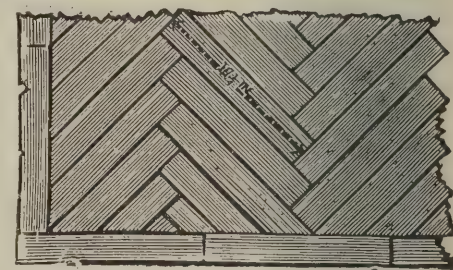
Deposits. 2½% Interest allowed on Deposit Accounts.

Advances made. Stocks and Shares bought and sold

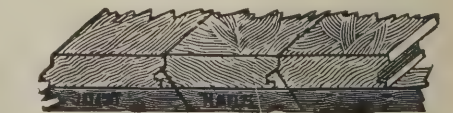
Apply Secretary,

Southampton Buildings, High Holborn, W.C.

FLOORING BLOCKS



Per 100 Blocks out of sizes.	YELLOW.		PITCHPINE.	
	At Wharf.	ex Ship within one Month.	At Wharf.	
17½ × 3 × 3	12 9	12 0	16 6	
17½ × 3 × 2	8 3	7 9	11 5	
17½ × 3 × 1½	6 9	6 3	9 0	



PRIME DRY OAK & PITCH PINE FLOORINGS

With Special Joint to conceal Nails—
1½ × 4 Oak, 56/9 Pitch Pine 27/- per square.
1 × 4 " 45/- " 22/9 "

These prices do not include desiccation.

VIGERS BROTHERS,
TIMBER MERCHANTS,

Only Address—67, KING WILLIAM STREET, E.C.

Telephone Nos. 601 and 602 Avenue.

Current Market Prices

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 10 0	1 13 0
Clover, best ...	per load	3 15 0	4 2 6
Hay, good	do.	3 10 0	3 15 0
Sainfoin mixture ...	do.	3 10 0	3 17 6
Straw	do.	1 12 0	2 0 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 0 5	—
Colza Oil, English ...	do.	1 3 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 15 0	2 17 0
Lead, white, ground, carbonated ...	per ton	16 0 0	—
Do. red	do.	15 0 0	—
Linseed Oil, barrels ...	per cwt.	0 19 6	—
Petroleum, American ...	per gal.	0 0 5 1/2	0 0 5 3/4
Do. Russian	do.	0 0 5	—
Pitch	per barrel	0 8 0	—
Shellac, orange	per cwt.	7 7 6	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Town	per cwt.	1 4 0	—
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	2 5 9	—

METALS.

Copper, sheet, strong ...	per ton	80 0 0	—
Iron, Statfs., bar ...	do.	5 12 6	8 0 0
Do. Galvanized Corrugated sheet ...	do.	10 15 0	—
Lead, pig, Soft Foreign ...	do.	13 8 9	—
Do. do. English common brands ...	do.	13 13 9	—
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	14 0 0	—
Do. pipe	do.	15 0 0	—
Nails, cut clasp, 3in. to 6in. ...	do.	9 5 0	—
Do. floor brads	do.	9 0 0	—
Steel, Statfs., Girders and Angles ...	do.	5 7 6	5 12 6
Do. do. Mild bars ...	do.	6 0 0	6 5 0
Tin, Foreign	do.	139 10 0	140 0 0
Do. English ingots ...	do.	140 0 0	141 10 0
Zinc, sheets, Silesian ...	do.	26 10 0	—
Do. do. Vienne Montaigne ...	do.	27 0 0	—
Do. Spelter	do.	24 0 0	24 5 0

TIMBER.

Soft Woods.

Fir, Dantzic and Memel ...	per load	2 10 0	4 15 0
Pine, Quebec, Yellow ...	do.	4 0 0	7 10 0
Do. Pitch, American ...	do.	2 8 0	5 0 0
Laths, log, Dantzic ...	per cu. fath.	4 0 0	6 0 0
Deals, Söderhamn Yellow, 3rd, 3x9 ...	per std.	12 5 0	—
Do. do. do. 3x8 ...	do.	9 15 0	—
Do. do. do. 2 1/2 x 7 ...	do.	10 0 0	—
Do. do. do. 4th, 3x9 ...	do.	10 0 0	—
Do. do. do. 3x8 ...	do.	9 5 0	—
Do. do. do. 5th, 4x11 ...	do.	8 10 0	—
Do. do. do. 4x9 ...	do.	9 10 0	—
Do. Meaberg, Yellow, Unsorted, 4x11 ...	do.	8 15 0	—
Do. Blankholm Yellow, 2nd, 4x9 ...	do.	9 10 0	—

Deals, Archangel (Kem), Yellow, 2nd, 3x11 ...	per std.	£ s. d.	£ s. d.
Do. do. do. 4th, 3x11 ...	do.	7 15 0	—
Do. do. do. 3x9 ...	do.	8 10 0	—
Do. Petschora, Yellow, 3rd, 3x11 ...	do.	9 15 0	—
Do. Gefle, do. 5th, 3x11 ...	do.	4 15 0	—
Do. Swartvik, Yellow, 3x9 ...	do.	6 10 0	—
Do. Pensacola pitch-pine, 3x9 ...	do.	10 10 0	—
Do. Gamleby, Yellow, Unsorted, 3x7 ...	do.	8 10 0	—
Do. Langror, Yellow, 2 1/2 x 11 ...	do.	6 0 0	—
Do. Stromma, Yellow, Unsorted, 2 1/2 x 7 ...	do.	8 15 0	—
Do. St. Petersburg, Yellow, 1st, 2 1/2 x 7 ...	do.	9 5 0	—
Do. Saguenay, Spruce, 2nd, 3x9 ...	do.	9 5 0	—
Do. do. do. 3rd, 3x9 ...	do.	8 10 0	—
Do. Quebec, Spruce, 3rd, 3x9 ...	do.	8 10 0	—
Battens, all kinds ...	do.	6 0 0	13 0 0
Flooring Boards rin. prepared, 1st ...	per square	0 10 6	0 11 6
Do. 2nd	do.	0 8 3	0 10 3
Do. 3rd, &c.	do.	0 7 3	0 9 0

HARD WOODS.

Ash, Quebec	per load	3 17 6	7 5 0
Birch, New Brunswick ...	do.	2 10 0	5 0 0
Do. Quebec do.	do.	2 10 0	5 15 0
Box, Turkey	per ton	7 0 0	20 0 0
Cedar, Cuba	per ft. sup.	0 0 3 1/2	0 0 3 1/2
Do. Honduras	do.	0 0 3 1/2	—
Do. Tobasco	do.	0 0 5	—
Elm, Quebec	per load	4 0 0	8 10 0
Jarrah, planks	per ft. cu.	0 2 6	0 3 0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0 0 3 1/2	—
Do. Tobasco	do.	0 0 5 1/2	—
Do. Cuba	do.	0 0 2 1/2	—
Do. African	do.	0 0 3 1/2	—

Oak, Wainscot	per log.	£ s. d.	£ s. d.
Teak, Indian, logs ...	per load	3 5 0	7 5 0
Do. do. planks	do.	10 0 0	18 15 0
Whitewood, American, logs	per ft. cu.	0 1 3	0 1 6
Do. do. planks and boards	do.	0 1 3	—

Coming Events.

Wednesday, July 5.

INSTITUTE OF SANITARY ENGINEERS.—Meetings of Flection Committee at 3.30 p.m., and Organizing Committee at 5.

ROYAL ARCHÆOLOGICAL INSTITUTION.—Mr. Charles Lynam on "A Short Note on Chepstow Parish Church," at 4 p.m.

Friday, July 7.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—President's At Home at 9, Conduit Street, W., from 8.30 to 11 p.m. Exhibition of Decorative Art.

ART WORKERS' GUILD (Clifford's Inn Hall, Fleet Street, E.C.).—Mr. Strang on "A Method of Portrait Drawing," at 8 p.m.

Saturday July 8.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club excursion.


EDINBURGH ARCHITECTURAL ASSOCIATION.—Annual Excursion to Dunkeld Cathedral, Murthly Castle and stobhall.

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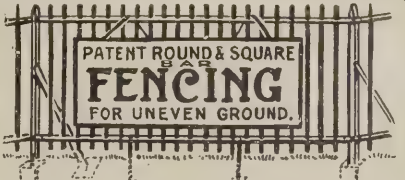
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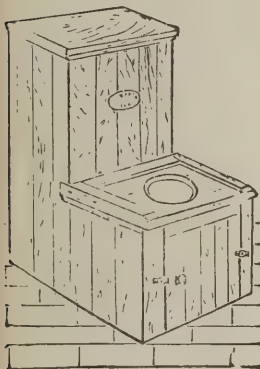
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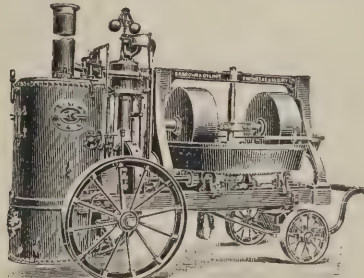
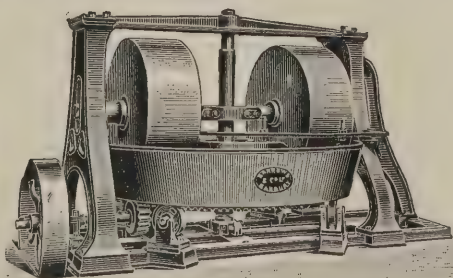
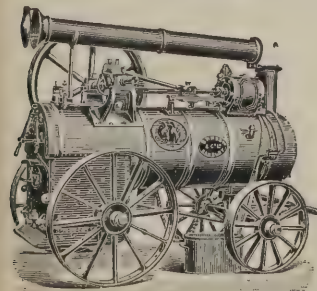
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ARCHITECTURAL ASSISTANT (26) wants POSITION in architect's (or engineer's) office. Seven years' experience. Working drawings and details, surveying, perspectives, etc.—A. E. P., 35, Carpenter Road, Edgbaston, Birmingham. 1189

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MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 9.
July, 1905.

PARLIAMENT AND FIRE- PREVENTION.

THE attention which is at present being accorded to matters of fire-prevention is probably quite unique in the annals of the House of Commons. In the first place there is a Committee sitting upon the London County Council's "Building Act Amendment Bill" for the county area, which Committee is also considering the City Corporation's "Escape from Fire Bill." Besides this, a "Select Committee" has been appointed to consider the question of escape from fire generally throughout the country. As the exact terms of the reference to this "Select Committee" are not generally known, we present the reference in full.

We trust the Select Committee will give very careful attention to the problem in its entirety, and if necessary will even have the terms of its reference extended to such questions as the escape from fire in places of worship.

The reference is as follows:—

"That a Select Committee be appointed to enquire as to the provision of means of escape from fire in factories, workshops, laundries, offices, shops, hotels and other buildings where persons work or live in large numbers, and to report what changes in the law are necessary for the protection of life, having special regard to the case of buildings in the occupation of more than one occupier.

"That Mr. Arkwright, Mr. James Bailey, Mr. Brigg, Mr. Munro Ferguson, Mr. Vincent Kennedy, Mr. Malcolm, Mr. H. L. W. Lawson, Mr. Norman, Mr. Ridley, Mr. Soames and Mr. Tuff, be members of the Committee.

"That the Committee have power to send for persons, papers and records.

"That three be the quorum."

FATAL FIRES IN LONDON.

With Remarks on Provisions Needed to secure the Escape of Persons endangered by Smoke or Fire in Buildings.

By JAMES SHEPPARD, A.I.E.E.,
Fire Insurance Surveyor.

THE loss of life by fire in the county of London, notwithstanding the efforts made and appliances provided for the prevention of such loss, has increased more rapidly than the increase of population, improvements in one direction being more than balanced by fatalities from other causes. The returns available for recent years are doubtless more complete than is the case for earlier years; on the other hand, these returns show that the number of lives lost at single fires during the past nine years is greater than previously experienced.

The average annual number of lives lost by fire during the years 1901-04, as shown by official returns, was ninety-eight, while the average number for six earlier periods of five years each ranged from 29.4 to 96.8 per annum.

It is satisfactory that the rate of increase during earlier periods has not been main-

tained, giving promise that the future will show a considerable reduction on the present serious loss of life by fire.

An analysis of returns published in the annual reports of the London Fire Brigade contained in the tables annexed proves that more than 80 per cent. of all deaths by fire occur in dwellings occupied in the majority of cases by more than one family, and that 83 per cent. of all persons who lose their lives by fire are females and children under five years of age. The clothes worn by women and young children are very liable to come in contact with and ignite at domestic fires, stoves or lights, or from the burning wick of an upset lamp. Such fires are difficult to extinguish before fatal injury may have resulted, especially if the clothes have been sprayed with mineral oil from a broken lamp reservoir, as is frequently the case.

The three boroughs of Stepney, St. Pancras and Southwark, out of the total twenty-nine cities and boroughs constituting the county of London, were alone responsible during 1901 to 1904 for nearly one-third of the total number of deaths by fire that occurred in dwellings. In very many of these cases the first material to take fire, as a consequence of conditions previously referred to, was the clothes of the victim; when this occurs all provisions for escape or for outside assistance are of no avail. Persons so involved have to rely on their own presence of mind or the instant assistance of some person present at the time. Fatal cases of this nature can only be avoided by the exercise of reasonable intelligence and care in the use of fires, lights and matches.

The London County Council are now the statutory authority both for saving life from fire and for public education, and therefore have every opportunity of giving suitable reading and other lessons by which the methods and importance of using fires, lights and matches with intelligence and care would be impressed upon their scholars.

Persons endangered by poisonous gases, smoke or fire in a building instinctively and wisely seek to reach the outer air at the earliest possible moment, usually making for the roof or a window. From ten to twelve persons each year in London escape with their lives by jumping from windows, and most of the rescues effected by fire brigades are made from roofs or windows. Any provisions for escape from fire to secure the best results must take into account this instinctive action of endangered persons.

Easy access to the roof, with provision for reaching adjoining roofs, meets this requirement in an admirable manner so far as the upper floors of buildings are concerned, and continuous outside balconies passing as many windows as possible, each window affording free access to the balconies, would provide an effective escape from other floors. The balconies should preferably lead to an enclosed staircase having doors opening

only to the outer air, on to the balconies, but this would not be essential in some cases where efficient portable fire-escapes are quickly available and portions of the balconies are sufficiently protected against fire from openings in the building.

Enclosed staircases in lofty buildings having doors opening direct into each storey may prove death traps for persons escaping from the upper floors. In the event of fire in the basement or ground floor of a building having an enclosed staircase with doors as described, smoke and poisonous gases could pass through the door openings over the heads of persons escaping from the lower floors, or these doors may and probably would be blocked open; the staircase enclosure would therefore be quickly filled with a suffocating atmosphere by which persons escaping from upper floors may be instantly rendered helpless and unable to make good their escape.

The instantaneous effect of inhaling atmosphere charged with the products of combustion, especially on persons escaping for their life, is not sufficiently realized. In nearly all fatal cases (except where the first thing to take fire is the person's clothes) the victims are rendered insensible before any fire reaches them. In fatal theatre fires where it has been considered that some obstruction on a staircase was responsible for loss of life it will be found on closer examination that the only real obstruction resulted from persons falling down insensible from inhaling poisonous gases.

The insidious and dangerous nature of atmosphere exhausted of oxygen and charged with the products of combustion, even if free from smoke, was shown in the case of a small fire at Whiteley's on April 19th last, when several firemen thoroughly accustomed to deal with similar cases were rendered insensible. If firemen succumb the general public cannot be expected to escape down an enclosed staircase filled with an atmosphere of this nature.

The following particulars with reference to fatal fires in London are given in Tables I. to V. annexed:—

Table I.—Number of fires at which life was lost or endangered during periods of five years from 1871-75 to 1896-1900 and for the four years 1901-04, distinguishing between fires in dwellings and in trade premises.

Table II.—Number of lives lost at each fatal fire during the above periods in dwellings and in trade premises.

Table III.—Occupation of premises where fires occurred by which life was lost or endangered during the four years 1901-04.

Table IV.—Number of fatal fires and lives lost in each of the cities and boroughs in the county of London during the four years 1901-04.

Table V.—Causes of fatal fires in the county of London during the four years 1901-04.

Fatal London Fires—cont.

TABLE I.—Number of fires at which life was lost or endangered in the County of London during periods named, distinguishing between the number of fires and lives lost or endangered in dwellings and in shop and trade premises, compiled from the annual reports of the London Fire Brigade.

Periods of five years.	Fires in dwellings at which life was lost or endangered.						Fires in shop and trade premises at which life was lost or endangered.						Totals.					
	Fires at which life was lost or endangered.			Fires at which life was lost in previous columns.			Fires at which life was lost or endangered.			Fires at which life was lost in previous columns.			Fires at which life was lost or endangered.			Fires at which life was lost in previous columns.		
	Number of fires.	Number of lives endangered, including lives lost.	Number of lives lost.	Number of fires.	Number of lives lost.	Ratio per cent. of lives lost to number endangered.	Number of fires.	Number of lives endangered, including lives lost.	Number of lives lost.	Number of fires.	Number of lives endangered, including lives lost.	Number of lives lost.	Number of fires.	Number of lives endangered, including lives lost.	Number of lives lost.	Ratio per cent. of lives lost to number endangered.	Average number of lives lost per annum.	Average number of fatal fires per annum.
1871-75	167	218	77	89	154	40.8	214	565	33	58	6.6	11.6	381	803	110	22.0	29.4	18.3
1876-80	212	284	97	108	194	38.0	231	478	31	46	6.2	9.2	443	762	128	25.6	30.8	20.2
1881-85	322	440	110	127	220	28.9	280	466	46	77	9.2	15.4	602	966	156	31.2	40.8	22.5
1886-90	424	538	149	168	238	31.2	276	411	54	89	10.8	17.8	700	949	203	40.6	51.4	27.1
1891-95*	500	738	256	289	512	39.2	217	370	60	93	12.0	18.6	717	1,108	316	63.2	76.4	34.5
1895-1900†	614	875	347	401	634	46.7	197	358	54	75	10.8	15.0	811	1,233	401	80.2	96.8	39.3
Four years—1901-04	707	907	275	303	687.5	33.0	279	491	49	92	12.25	23.0	1,006	1,406	324	81.0	98.0	27.9
																		3,266,987
																		3,834,194
																		4,232,118
																		4,556,541

* Extract from report for the year 1892: "Persons slightly burned on face or hands or cut from glass not included."

† Extract from report for the year 1896: "Life said to be endangered if the person referred to left the house by irregular means." "It is open to question whether the fatal occurrences registered in previous years by us are as correct as in the case for 1896."

TABLE II.—Number of lives lost at each fatal fire in the County of London during the periods named.

Number of lives lost at each fire.	Fires in dwellings.										Fires in shop and trade premises.										Totals.													
	1.	2.	3.	4.	5.	6.	9.	10.	Fatal fires.	Total lives lost.	1.	2.	3.	4.	5.	6.	7.	8.	10.	Fatal fires.	Total lives lost.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	Fatal fires.	Total lives lost.	
1871-75. Number of fires	-	67	8	2	-	-	-	-	77	89	25	3	1	1	1	-	-	1	-	-	33	58	92	11	3	1	1	-	1	-	-	-	110	147
1876-80	-	86	11	-	-	-	-	-	97	103	21	7	1	2	-	-	-	-	-	-	31	46	107	18	1	2	-	-	-	-	-	-	128	154
1881-85	-	99	8	1	1	-	-	-	110	127	32	6	3	2	2	1	-	-	-	-	46	77	131	14	4	3	3	1	-	-	-	-	156	204
1886-90	-	135	10	3	1	-	-	-	149	163	37	9	4	2	-	1	-	1	-	-	54	89	172	19	7	3	-	1	-	1	-	-	203	257
1891-95	-	232	19	3	-	2	-	-	256	281	47	6	1	2	3	-	-	1	-	-	60	93	279	25	4	2	5	-	1	-	-	-	316	382
1896-1900	-	317	17	7	2	2	-	1	347	409	43	6	2	1	2	-	-	-	-	54	75	360	23	9	3	4	-	-	1	-	-	401	484	
Four years—1901-04	-	259	11	3	1	1	-	-	275	300	33	7	5	-	-	1	2	-	-	49	92	292	18	8	1	-	2	2	-	-	-	324	392	

TABLE III.—Occupation of premises situate in the County of London where fires occurred by which life was lost or endangered during the years 1901-04.

Occupation of premises where fires occurred.	1901-1904.			
	Fires at which life was			
	Lost or endangered.		Lost.	
	No. of fires.	No. of lives lost or endg.	No. of fatal fires included in previous columns.	Lives lost
Dwellings	707	907	275	300
Drapers, haberdashiers, hosiers	19	50	4	12
Warehouses, elec. supply wrks.	5	19	1	10
Oil shops, chandlers	19	29	4	8
Coffee shops, refreshment rms.	13	23	2	8
Ticket writer	1	7	1	7
Boot and shoe maker	1	18	2	4
Tobaccoist	7	14	4	4
Vinuallers and beer shops	25	35	3	3
Hairdresser	6	8	1	3
Provision dealer	6	12	2	3
Art potter	1	3	1	3
In the street	17	24	2	2
Confectioner	17	22	1	2
Railway sidings and vans	2	4	2	2
Stationer	2	3	2	2
Ammunition works	2	3	1	2
Tin plate worker	1	4	1	2
Clothier, outfitter, tailor	8	12	1	1
Baker	6	11	1	1
Fried fish shop	6	7	1	1
Motor-car works	4	6	1	1
Butcher	4	4	1	1
Dress, mantle, trimming works	3	6	1	1
Board school	2	3	1	1
Sign writer	2	2	1	1
Farm	1	2	1	1
Gasworks	1	2	1	1
Barge	1	1	1	1
Unoccupied building	1	1	1	1
Carrier	1	1	1	1
Trunk maker	1	1	1	1
Methylated spirit maker	1	1	1	1
General dealer	6	12	—	—
Incandescent mantle makers	1	10	—	—
Greengrocer and fruiterer	8	10	—	—
Furniture dealer	5	9	—	—
Laundry	4	7	—	—
Steamship	2	7	—	—
Chemists & mfnactng. chemists	3	6	—	—
Building in course of erection	4	5	—	—
Hospital	1	5	—	—
Gasfitter & hot-water engineer	3	4	—	—
Church	2	4	—	—
Fishmonger	3	3	—	—
Offices	3	3	—	—
Printer	2	3	—	—
Miller	1	3	—	—
Upholsterer	1	3	—	—
Naturalist	1	3	—	—
Silversmith and jeweller	2	2	—	—
Dairy	2	2	—	—
Cabinet maker	2	2	—	—
Wardrobe dealer	2	2	—	—
Builder	2	2	—	—
Wastepaper dealer	2	2	—	—
Pianoforte maker	2	2	—	—
Grocer	2	2	—	—
Firewood dealers	1	2	—	—
Hat manufacturer	1	2	—	—
Bicycle maker	1	2	—	—
Glass shade maker	1	2	—	—
Corn dealer	1	2	—	—
Florist	1	2	—	—
Wine merchant	1	2	—	—
Optician	1	2	—	—
Horseflesh dealer	1	2	—	—
Biscuit manufacturer	1	1	—	—
Cane worker	1	1	—	—
Stick manufacturer	1	1	—	—
Gilder	1	1	—	—
Electrical engineer	1	1	—	—
Electric power station	1	1	—	—
Engraver	1	1	—	—
Florist, artificial	1	1	—	—
Library (Public)	1	1	—	—
School	1	1	—	—
Stable	1	1	—	—
Shoe dealer	1	1	—	—
Tea dealer warehouse	1	1	—	—
India-rubber factory	1	1	—	—
Ropemaker	1	1	—	—
Watchmaker	1	1	—	—
Carpenters' hall	1	1	—	—
Fire station	1	1	—	—
Factory	1	1	—	—
Ice merchant	1	1	—	—
Railway arch	1	1	—	—
Mineral water factory	1	1	—	—
Varnish factory	1	1	—	—
Undertaker	1	1	—	—
Pipemaker	1	1	—	—
China and glass dealer	1	1	—	—
Cycle tyre works	1	1	—	—
House decorator	1	1	—	—
Pawnbroker	1	1	—	—
Plumber	1	1	—	—
Fancy goods importer	1	1	—	—
Photographer	1	1	—	—
Dwellings	299	499	49	92
	707	907	275	300
Total	1006	1406	324	392

TABLE IV.—Number of fatal fires and lives lost during the years 1901-04 in each of the cities and boroughs constituting the County of London.

Cities and boroughs.	Dwellings.		Shop and trade premises.		Totals.		Boroughs.	Dwellings.		Shop and trade premises.		Totals.	
	Fatal fires.	Lives lost.	Fatal fires.	Lives lost.	Fatal fires.	Lives lost.		Fatal fires.	Lives lost.	Fatal fires.	Lives lost.	Fatal fires.	Lives lost.
North of River.							South of River.						
Stepney	40	42	6	13	46	55	Southwark	18	20	—	—	18	20
St. Pancras	24	31	1	3	25	34	Lambeth	15	18	1	1	16	19
Bethnal Green	11	12	6	14	17	26	Bermondsey	11	11	3	3	14	14
Finchbury	13	16	4	6	17	22	Battersea	9	9	3	3	12	12
Islington	16	18	3	3	19	21	Wandsworth	6	6	3	5	9	11
London City	2	2	2	17	4	19	Lewisham	6	6	1	1	7	7
Poplar	14	14	1	2	15	16	Deptford	5	5	1	1	6	6
Westminster City	11	12	3	4	14	16	Woolwich	4	5	1	1	5	6
Shoreditch	14	14	1	1	15	15	Camberwell	3	3	—	—	3	3
Hackney	9	11	2	3	11	14	Greenwich	—	—	1	2	1	2
Kensington	13	13	—	—	13	13							
Holborn	5	5	2	5	7	10							
Paddington	7	7	—	—	7	7							
Fulham	6	7	—	—	6	7							
St. Marylebone	4	4	1	1	5	5							
Hampstead	4	4	—	—	4	4							
Stoke Newington	2	2	1	1	3	3							
Chelsea	1	1	2	2	3	3							
Hammersmith	2	2	—	—	2	2							
North of River	198	217	35	75	233	292							
South of River	77	83	14	17	91	100							
Totals	275	300	49	92	324	392		77	83	14	17	91	100

TABLE V.—Causes of fatal fires in the County of London during the years 1901-04.

Causes of fires.	Dwellings.		Shop and trade premises.		Totals.	
	No. of fires.	No. of lives lost.	No. of fires.	No. of lives lost.	No. of fires.	No. of lives lost.
Playing with fire or matches	67	71	3	3	70	74
Mineral oil lamps upset	44	49	3	9	47	58
or spirit stoves upset	5	5	2	4	7	9
Clothes ignited at mineral oil stove	3	3	—	—	3	3
" " mineral lamp	1	1	—	—	1	1
" " fire	37	37	1	1	38	38
" " gas stove	6	6	1	1	7	7
" " watchman's fire	—	—	1	1	1	1
Clothes, intentional ignition of	2	2	—	—	2	2
Candle, clothes ignited at	10	10	2	2	12	12
Airing linen	1	1	—	—	1	1
Spark or cinder falling from fire	20	21	1	1	21	22
Falling on fire in grate	1	1	1	1	2	2
Vapour of spirit ignited at flame	3	3	4	4	7	7
" " by spark	—	—	1	1	1	1
Ignition of spirit washed from refinery by storm	1	3	—	—	1	3
Lucifers	3	3	1	1	4	4
Light thrown down	2	2	1	1	3	3
Gas escape	2	2	1	1	3	3
Cigarette	1	1	—	—	1	1
Japan boiling over	—	—	1	2	1	2
Goods ignited at gas light	—	—	1	2	1	2
Tar boiler leaking	—	—	1	1	1	1
Ignition of soot at back of stove	1	1	—	—	1	1
Blocked up flue	—	—	1	3	1	3
Explosion	—	—	1	2	1	2
Spirit lamp	1	1	—	—	1	1
Unknown	64	77	21	51	85	128
Totals	275	300	49	92	324	392



FIG. 1.—THE COLUMN TESTING PLANT AT NEW YORK IN 1896. The illustration shows the testing chamber with steel frame for application of hydraulic power, also gas-producer and boiler.

FIRE TESTS WITH UNPROTECTED STANCHIONS.

ALTHOUGH it should be obvious by this time to any civil engineer or architect that it is impracticable to use unprotected columns and stanchions in building construction if there is to be the slightest semblance of fire-resistance in their buildings, yet it remains a fact that, no matter what the experience has been, some of our conservative professional men are still using unprotected steelwork and ignorantly describing it as "fireproof." The lessons at actual fires during the last twenty years should have been sufficient to prove that even the best steelwork or best cast-iron columns are useless, as far as fire-resistance is concerned, if not properly protected.

This fact is so obvious that the British Fire Prevention Committee, which is generally ready to undertake fire tests with work in general use, on public grounds, drew the line at proving this fact at their testing station; yet we would almost wish that a systematic series of experiments had been conducted by them with stanchions and columns, both

protected and unprotected, so that the facts could have been scientifically recorded for reference purposes.

As the matter stands at present, there have only been three series of tests anywhere in the world intended to show what should be obvious, but which was certainly not properly realized at the time of these experiments, nor, as a matter of fact, even to-day. We refer to some tests taken in New York City with two stanchions and three columns, to a series of tests undertaken by the municipality of Hamburg with sections of columns and stanchions, protected and unprotected, and to some investigations at Munich with stanchions, columns and piers.

Regarding the American tests, they were the first so-called independent tests in the United States, inasmuch as they were arranged by the professional bodies concerned, namely, the architectural and engineering societies of the United States. Unfortunately these experiments came to an untimely end owing to disagreement, and what promised to have been a most valuable standing institution in the United States came to grief without having done much good. It is, neverthe-

less, interesting to search the records and present the results of two of the tests undertaken at the time in respect to unprotected stanchions, for though of short duration the arrangements for the tests in question were quite excellent.

The stanchion tests were undertaken as far back as 1896, but are scarcely known in this country. The plant which was put up for these investigations was a very up-to-date one for that time, and in a way served as a guide to what was afterwards done in 1898 by the Fire Prevention Committee of this Metropolis.

The testing chamber for these New York tests comprised an arched brick building as shown in our illustration, the fuel being gas from a generator supplemented at times by a spray of naphtha. To procure the necessary pressure on the column during the investigations hydraulic power was used, whilst the temperatures were taken with the aid of a pyrometer.

It is well to present the results of some of these early investigations at a time when so much controversy rages round our proposed London Building Act. Thus, for instance, if

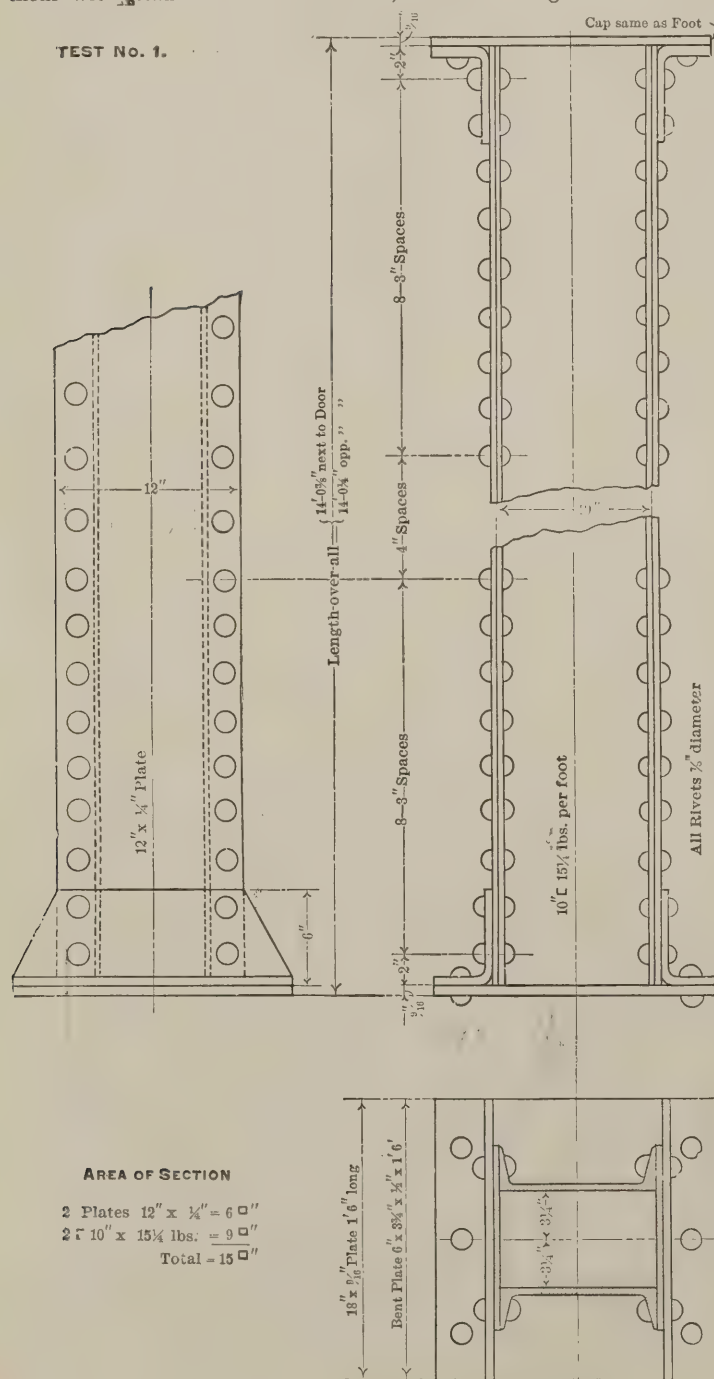


FIG. 2.—THE STANCHION USED IN TEST NO. 1.

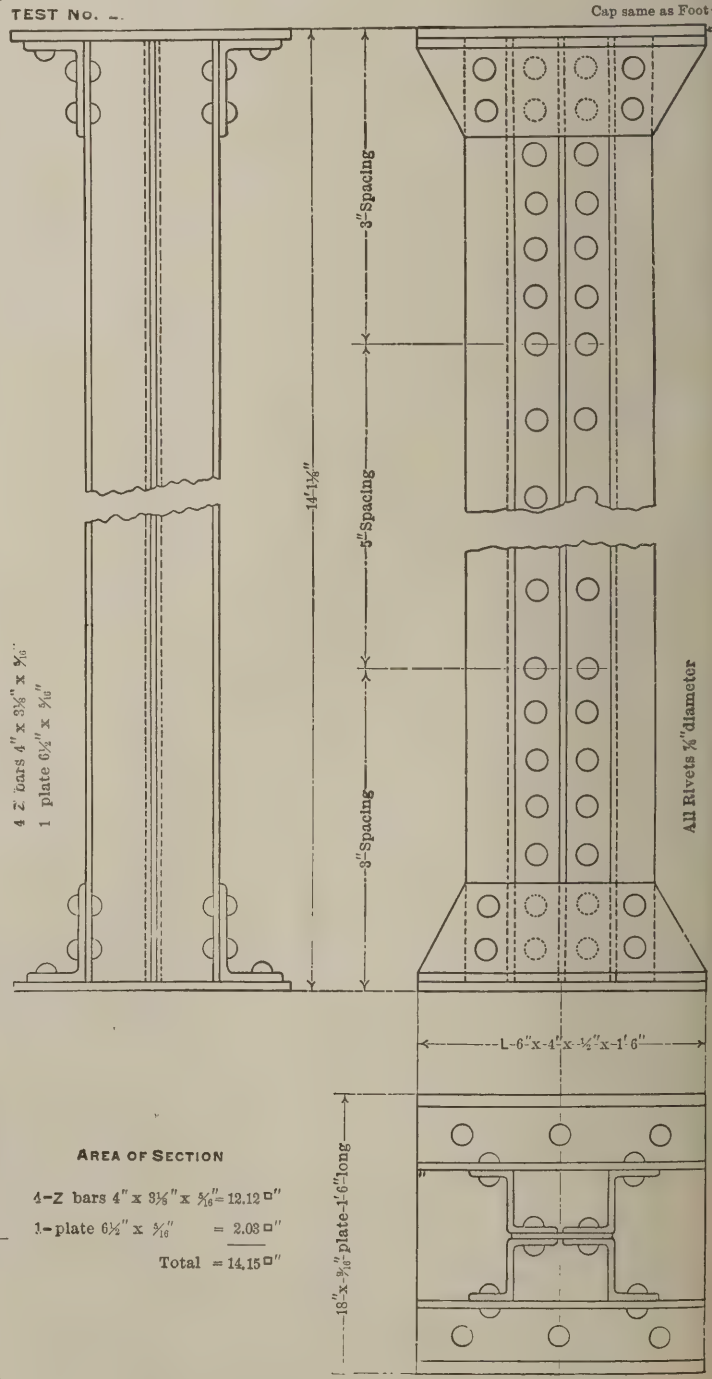


FIG. 5.—THE STANCHION USED IN TEST NO. 2.

there were any more forcible demonstration required as to the necessity of the proposed enactment requiring all metalwork to be protected by zincs. of fire resisting material, one need only view the photographs we present on this occasion to see how essential and how useful the proposed enactment would be.

Space prohibits our presenting particulars of the column tests undertaken at New York, but the records of the two stanchion tests

presented herewith with the logs of the tests should suffice.

Column* Test No. 1.

Fire test without water. Steel column.
The walls of the furnace were of common brick, and the door was closed with a double thickness of sheet iron, which made the opening practically tight. The column was a Carnegie steel box channel of the dimen-

sions as shown in the illustration (Fig. 2), and was unprotected.
The weather was clear and warm, with only a slight breeze from the west. Temperature of air, 80 degs. Fahr. in the shade. The gas producer was fired the day before, with valve closed against furnace. The packing in the hydraulic cylinder leaked, and the fitting of the pipe gave out as test started. These causes delayed the use of the water pressure.

* In America a stanchion is also known as a column.

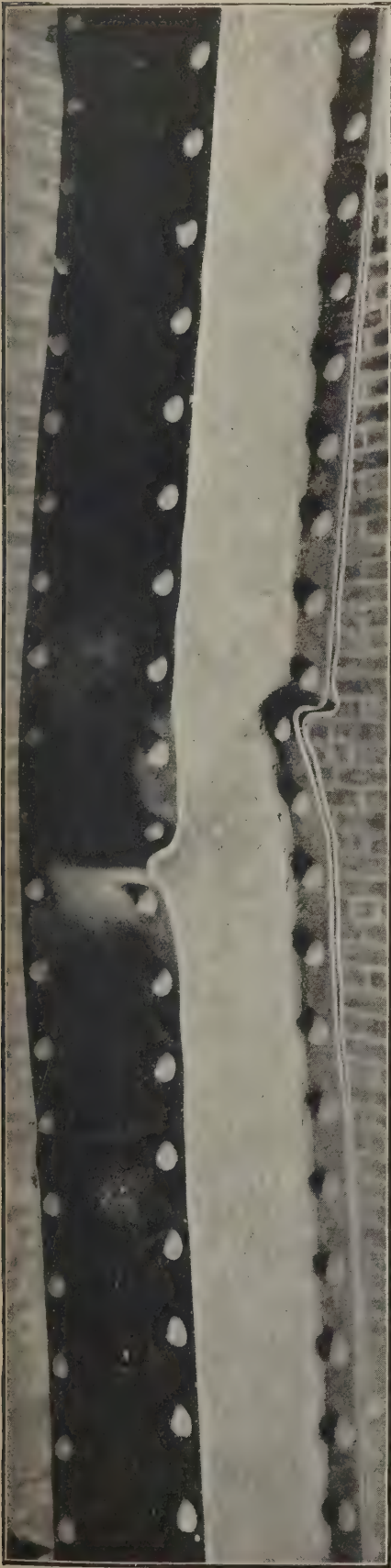


FIG. 3.

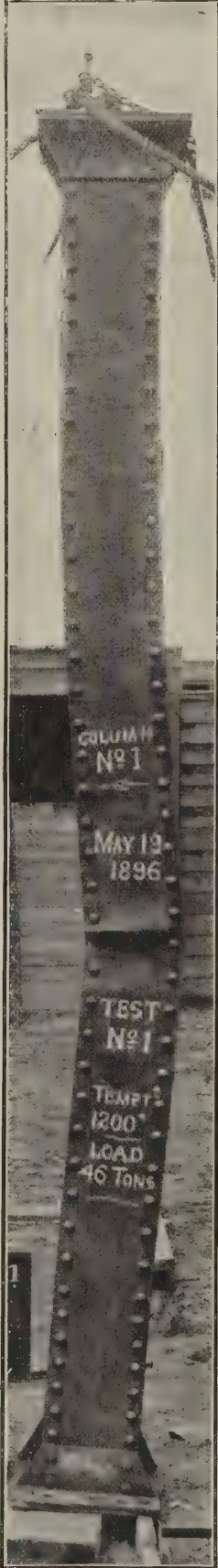


FIG. 4.

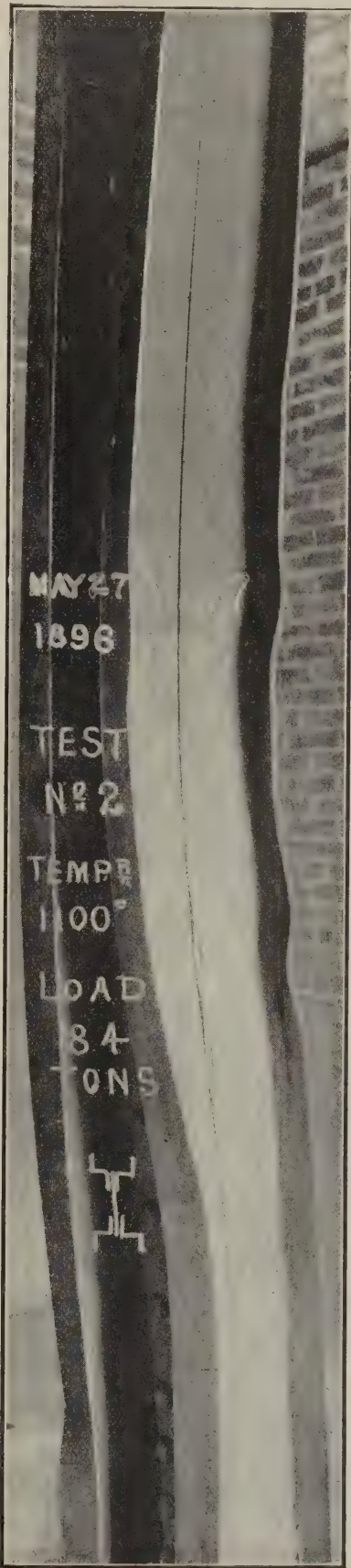


FIG. 6.



FIG. 7.

LOG OF TEST (COLUMN TEST No. 1).

Time.	Pyrometer.	Hydraulic pressure.	Remarks.
H.M.	Degs. Fahr.	Tons.	
10.35	...	...	Wood fire lit.
10.45	...	...	Gas turned into furnace.
11.02	...	...	Furnace door closed.
11.03	...	...	Naphtha valve slightly opened.
11.13	...	...	Pyrometer put in furnace through lower hole, 2½ft. above the furnace door, with point 12ins. from column.
11.19	1,025	...	Pressure on column. Light load. Pyrometer point 24ins. from column.
11.20	1,050	...	Raking gas-producer, gas shut.
11.25	600	...	Gas turned on again.
11.28	...	...	No naphtha.
11.33	1,025	...	Half faucet of naphtha.
11.36	1,225	...	
11.38	1,200	...	
11.40	1,175	14.13	Water pressure on.
11.41	1,180	28.26	Quarter faucet of naphtha.
11.46	1,175	...	Pressure off, water valve repacked.
11.50	1,175	...	Closed all air openings. Water pressure on.
11.55	1,200	48.06	Column began to show "red."
11.59	1,210	...	Column began to yield.
11.59	1,225	42.41	Hydraulic pressure falling fast.
12.10	1,230	...	Pyrometer shut off. Pyrometer raised to upper hole, 8½ft. above floor, and point 3ft. from column.
12.16	1,230	...	
12.25	1,250	...	Gas shut off.

The column would have failed sooner if the working load of 80 tons could have been used.

The result of the test is shown in the flashlight photograph (Fig. 3) taken of the column before it was disturbed. After the column was removed from the furnace, photograph (Fig. 4) was taken. The brick walls cracked, the greatest damage taking place where one wall was bonded into the next,

and the cracks at these places extended through the bricks. Along the horizontal joints the walls cracked most on the bond courses. All the walls were hot, the 8in. wall being too hot to hold the hand in contact with it.

Strength by Gordon's formula:—

Breaking strength per sq. in. ... 45,630 lbs.
Area of cross section ... 15 sq. in.
Breaking load, 15 by 45,630 ... 684,450 lbs. 342 tons.

Actual greatest load, cold, 141¼ tons, with no change of form.

Column Test No. 2.

Fire test without water. Steel column. Furnace same as Test No. 1.

The column was a Carnegie steel Z-bar, as shown in illustration (Fig. 5), and was uncovered. The weather was clear and warm, with a moderate breeze from the north-west. Temperature of air, 80 in shade.

The result of this test is shown in Figs. 6 and 7.

The Professional Fire Service Association of Germany held its annual meeting at Bremen during the past week, when a considerable amount of valuable work was carried through on the fire-preventive side, this work having special relation to improved forms of building construction and of theatre safety. There were a number of valuable papers and also much useful discussion. It is a matter of moment to observe that in future the German professional fire-brigade officer will have to be a Royal Engineer, or he must have passed the statutory examinations of an architect, surveyor or civil engineer. Thus the growing tendency of making the professional fire service of Germany a technical profession in the best sense of the word is apparently to be carried out in the most energetic manner. Of the fifty-nine professional fire brigades in Germany nearly all are already officered by members of the technical professions.



EFFECT OF FIRE ON A FACTORY IN WHICH THE CAST-IRON COLUMNS HAD NOT BEEN PROTECTED.

LOG OF TEST (COLUMN TEST No. 2).

Time.	Pyrometer.	Hydraulic pressure.	Remarks.
H.M.	Degs. Fahr.	Total load Tons.	
2.23	80	...	Pyrometer point 3ft. from column.
2.24	200	84.8	Wood fire lit.
2.30	850	"	Gas turned on.
2.33	...	"	Door closed. Full cock of naphtha.
2.35	1,000	"	One-quarter cock of naphtha.
2.36	1,300	"	
2.37	1,350	"	
2.38	1,375	"	Naphtha closed.
2.39	1,300	"	
2.40	1,125	"	One-eighth cock of naphtha.
2.40½	1,300	"	
2.41	1,325	"	
2.42	1,250	"	
2.43	1,200	"	
2.44	1,175	"	Naphtha cock closed to "dropping."
2.45	...	"	Pyrometer moved to 2ft. from column as flame touched point.
2.46	1,125	"	Column began to yield.
2.47	1,125	"	Column yielding fast.
2.49	1,100	"	Impossible to maintain hydraulic pressure.
2.51	1,100	"	Pump and gas stopped.
2.52	900	"	Pyrometer closed.

THE NEW TESTING STATION.

THE British Fire Prevention Committee's new testing station, which was opened on June 28th, is situated off Lodge Road, Regent's Park. This is Committee's third testing station, the first being in the same neighbourhood and opened in 1898, the second in Bayswater and opened in 1901.

That the Committee should have so frequently removed its station, and should have always occupied sites where the tenure was terminable at short notice, is due to the fact that the primary principle in selecting the location for a testing station has always been its proximity to Charing Cross and its accessibility from all parts of London. The principle laid down has been that unless the testing station has been within easy cab distance from Charing Cross it would be impossible to obtain, as workers, those members of the Committee who are best able to conduct the operations, of whom the majority are busy men. Any question of having to catch trains to the outlying suburbs, or not being easily available if wanted, whilst at the testing station would practically prevent their active co-operation. Suitable sites within easy reach are most difficult, however, to find, and mostly only on property belonging to public authorities or corporations who have land temporarily idle awaiting the extension of their own works. It is on such property that the testing stations have always been housed and have from time to time had to make way for public works. It would have certainly been far more economical to have immediately taken a testing station some thirty miles outside London, and to have had no removal of plants; but from the technical point of view, *i.e.*, that of getting the best available technical advice and supervision gratuitously, the present policy as to location has been adopted as the only possible one, even if involving great expense.

The New Plant.

The new plant for testing building materials, systems of construction, &c., comprises a set of four testing huts, in which floors, partitions, doors, ceilings, &c., can be tested together with the necessary equipment. Three of these huts were ready for the opening day, two measuring 20ft. by 10ft. and one 20ft. by 15ft. The huts are laid down in two rows, and their construction is explained by the photograph showing a view of the plant, or more particularly of hut No. 1, which can be converted to various purposes. The materials used in their construction are stock bricks with lime mortar, the builders being Messrs. Pitcher & Son, of London.

The fuel generally used is gas, produced on the spot by a generator supplied by Messrs. F. W. Mason, Ltd., of Manchester. The gas is conveyed from the generator by pipes to the

several huts, and the supply is regulated by valves and dampers, and as the gas enters the huts from the branch pipes it is diffused by means of mixing chambers of firebrick as shown.

Each hut has door openings, ventilation and observation holes, the doors being closed by brickwork during a test, and the ventilation holes blocked, according to requirements, by firebrick or fire-clay.

Each chamber for a floor test allows for the floor under investigation to be placed at least 8ft. above the floor of the hut. The chambers are roofed in with galvanized iron or tarpaulin, when necessary.

Bricks or pig iron are used for any loads that may be applied to floors under investigation, and water is applied from a steam

ing appliances, such as thermostats, sprinklers, &c. Similarly, arrangements have been made for conducting special tests with lamps, stoves, electrical apparatus &c.

The Opening Tests.

The tests on the opening day were as follows:—

Two pairs of horizontal wire-glass skylights by Messrs. Pilkington Brothers, of St. Helens.

Two patent wood doors in frames by Messrs. Gilmour Door Co., of Canada and London.

A "tile" floor by the National Freproofing Co., of Pittsburgh, U.S.A.

The first of these tests with wire-glass skylights was for classification in the "temporary protective class" (class A). Thus these skylights had to withstand a fire test of 45 mins. duration running to a temperature of over 1,500 degs. Fahr., followed by the application of water for 2 mins.

The wood doors, one of which was 1½ ins. thick throughout and the other of which was a 1½ ins. panelled door, were intended for classification in the "temporary protective" (class B), thus being practically identical with the first-named test except that the duration of the test was for 60 mins. instead of for 45 mins.

The official reports of the results of these tests will be issued in due course, but in the meantime it might be of interest to say that the skylights, the 1½ ins. solid door and the floor in question apparently attained classification.

The Opening.

There was no formal opening of the testing station, but the plant was informally started by Sir William Preece, K.C.B., F.R.S., who took the opportunity to address a few



THE NEW CONVERTIBLE TESTING CHAMBER.

fire engine or from a manual pump, as required.

Records of temperatures are taken as far as possible by pyrometers. The instruments used are recording pyrometers, designed by the late Sir William Roberts-Austen, K.C.B., F.R.S., and manufactured by Messrs. James Pitkin & Co., of London. They rely for their indications on the measurement of the current generated by thermo-junctions, which are placed in various parts of the huts. Temperatures up to 3,000 degs. Fahr. (which is 500 degs. Fahr. higher than has so far been required at the testing station) can be read.

Visual observation as to work under investigation are also recorded, as far as possible by photography.

Deflections are measured by level and staff or by weights and pulleys.

There is a supplementary equipment available for any necessary laboratory tests with fire-preventive, fire-alarm and fire-extinguish-

words to the assembled members of the Committee. He laid stress on the fact that the work was being carried out by voluntary effort on the part of a number of professional men, and that these efforts were supported entirely by voluntary subscriptions and donations. As the senior member of Council and one of the first supporters of the Committee's movement for some eight years, he expressed his surprise that whilst the public authorities give moral support to the work and encourage it, this support has scarcely ever taken the form of financial aid. The public authorities financially supporting the work were quite the exception, and, curiously, these exceptions were partly Continental authorities. Sir William Preece considered the time had now arrived when municipal and also Government grants could well be sought, as the work had proved itself so efficient, so independent and so useful.

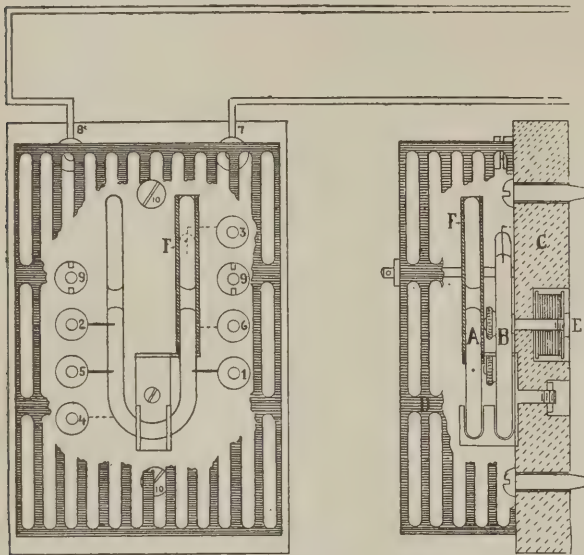
The attendance at the tests was much as

usual, but included several distinguished visitors, among others being Commandant Welsch (the leader of the Belgian Fire Preventive Service), Sir Thomas Pile, Bart., and Colonel Winn, R.E. Representatives of the Government Departments, the London County Council and other public offices were present.

Impending Tests with Proprietary Work.

The following are on the list of impending tests with proprietary work; those next in rotation will take place towards the end of July:—

- (1) The Asbestic Brick and Tile Co. (London). A test with a partition of asbestic bricks. (2nd test.)



THE AUTOPYROPHONE THERMOSTAT.

- (2) Messrs. Coignet (Paris and London). A test with an armoured concrete floor on the Coignet system.
- (3) Messrs. Faber (Berlin). A test with a floor. (July.)
- (4) Messrs. Gibson & Co. (London). A test with a roller shutter. (July.)
- (5) The National Fireproofing Co. (U.S.A.). A test with a tile partition. (July.)
- (6) The New Expanding Metal Co. (London). A test with a floor and girder coverings.
- (7) Messrs. Jabez Thompson (Northwich). Tests with protective coverings to stanchions.
- (8) Messrs. Skelton & Co. (London). A test with a floor of broad flange-girders and concrete. (July.)

New Member of the Executive.

Mr. Oswald C. Wylson, F.R.I.B.A., replaces the late Mr. Ellis Pritchett, F.R.I.B.A., on the Executive.

AUTOMATIC FIRE ALARM TEST.

REPORT No. 94 of the British Fire Prevention Committee deals with a series of tests with an automatic fire alarm system put forward by the Autopyrophone Co., of Copenhagen. There are seven tests, of which the objects are given below. Speaking generally, the objects of the test were fulfilled.

The appliances under review are of considerable interest, and open up a new field in automatic fire alarm design, based upon the relative rapidity in the increase of temperatures rather than the attainment of specific temperatures. The appliances seem, however, still to be somewhat in the laboratory stage, requiring simplification for actual use on a large scale.

The tests, which from the lengthy report appear to have been of a very laborious character, are no doubt the most elaborate tests of their kind conducted by the British Fire Prevention Committee, and the results are recorded in great detail.

The preface to the report, written by Mr. James Sheppard, A.I.E.E., is one which, we think, however, requires publication in full, and thus we present it. It refers very pointedly to one of the causes of the Baltimore conflagration:—

Object of Tests.

Tests A¹, A², A³.—To ascertain the temperature and time at which danger and fire calls would be given by the Autopyrophone Detectors on indicators, after the temperature had been artificially raised by gas stoves at different rates of increase—to simulate a smouldering fire.

Tests B¹, B², B³.—To ascertain the temperature and time at which danger and fire-calls would be given by the Autopyrophone Detectors on indicators and bells, after a fire has commenced, causing a moderate increase of temperature, and also the amount of damage shown when the fire has been extinguished by hand appliances after a lapse of three minutes from the first fire-call.

Tests C.—To ascertain the working of provisions for avoiding a fire-call from any fault on the system; and also if all faults that may arise will at once give a trouble-call, or can be readily discovered by testing the plant; further, if in any exceptional case a danger-call is caused by some unforeseen occurrence, other than a fire, i.e., exceptional heating of short duration, there will be time enough to discover and remedy such occurrence before a fire-call would be given.

Observations by James Sheppard, A.I.E.E.

The importance of fire brigades receiving the earliest possible notice of the outbreak of fire in their respective districts is universally recognized.

Having this object in view, fire brigade authorities responsible for the protection of important centres provide and maintain throughout their territory numerous public fire-alarm points, with extensions in some cities inside

private premises, having electric connection with brigade stations, for use by watchmen or other persons who may discover outbreaks of fire.

The provision in a similar manner of thermostats or automatic fire detectors throughout private establishments, having electric connection with suitable indicators, preferably placed in the nearest fire brigade station, simply constitutes a further development of the fire alarm systems above described.

In the automatic fire detector, consisting of a "differential" and a "fixed" part, known as the "Autopyrophone," which has been subjected to the tests described in the following report, pressure of vapour from a volatile spirit, resulting from expansion under increase of temperature, is applied to a column of mercury in a glass tube, causing displacement of the mercury with the consequent opening of a closed electric circuit, this being arranged so as to close a secondary open circuit by which signals are given for transmission to any desired position.

With every provision for securing notice automatically of faults or other contingencies that may arise in connection with electric circuits, as used in the systems under review, it is nevertheless desirable to make daily tests to definitely ascertain that every part is in working order.

It is also necessary that every signal or call that may be given should receive instant attention.

The importance of this was shown by the Baltimore conflagration of the 7th and 8th of February, 1904. The Hurst "Stores," where this conflagration originated, were equipped with automatic alarms, from which a trouble or danger signal was received, but as the establishment at the time was closed without watchman or other person on the premises, this first signal, which was really the commencement of a fire-call, was disregarded. Twenty-five minutes later a definite fire-call was received from the automatic alarms, and promptly responded to by the fire brigade, who were then (owing to the great extent and nature of the building with its open stair and lift shafts, light wells and inflammable contents, part of which under the action of heat freely gave off gases or vapours leading to an explosion sufficient to break the window glass) unable to control the fire, which ultimately spread over 140 acres covered with buildings, causing a loss of ten millions sterling.

The National Fire Brigades' Union devoted last week to a series of most instructive competitions in the Crystal Palace grounds, where a large number of men were also under canvas. It is interesting to observe that the number of chief officers of volunteer fire brigades who are borough surveyors or borough engineers of their localities is rapidly increasing.

Combined Fire-Engine and Fire-Escape.—At the instance of the Beckenham Fire-Brigade, Messrs. Bayleys (Ltd.), of Newington Causeway, have fitted one of their horsed fire-escapes with an appliance which is designed to enable a jet of water to be thrown on a fire as soon as the escape arrives, without the delays which may be occasioned while the firemen find a hydrant and make the necessary connections. It consists of a copper cylinder holding 24 gallons of water. Connected with it there is an ordinary steel cylinder of compressed air by the aid of which the water can be forced out along 150 ft. of hose.

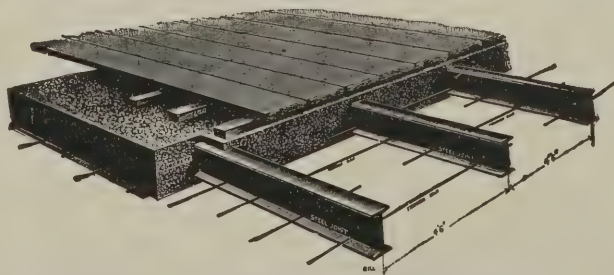
HOMAN'S STEELED CONCRETE FIREPROOF FLOORS.

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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

July 12, 1905. Vol. 22, No. 544.

6, Great New Street, Fetter Lane, E.C.

Summary.

No improvement can be recorded in the London trade for the month of June, and the deliveries from landed stock have fallen off again by something over 2,000 standards, but this is to some extent compensated by a better delivery over side. (Page 22.)

A ferro-concrete linen factory has been erected in Belfast. Having regard to the delicate nature of the fabrics made, it was essential that the new factory should be as nearly as possible free from dust, and that the ill-effects of machinery vibration should be absent. After careful consideration the Hennebique system of ferro-concrete was adopted for the floors. (Page 22.)

The bleak countryside north of the town of Morlaix recalls in its natural features, in its history and in its people the "Old Cornwall" across the Channel. In both provinces are the same granite rocks, the same bleak and romantic landscape, the same austere and uncouth art, the same mingled tradition of Christian faith and heathen superstition. It is useless to look for architecture of the more elaborate kind in a country which can never have been wealthy, where the staple material is granite, and where it is a difficult matter to build snugly and tightly against the keen weather. (Page 16.)

Foundations of stanchions and piers taking a heavy load should be built in pedestal form and the stones under the heavily loaded portions not projected more than the transverse strength of the stone will safely sustain. (Page 23.)

The monument to the late Lord Salisbury in Westminster Abbey will take the form of a recumbent effigy, and will be carried out by Mr. Bodley and Mr. Goscombe John. (Page 24.)

Mr. A. Drury, A.R.A., is to be paid £1,200 by the London County Council for the modelling and casting of each of the eight panels for Vauxhall Bridge. (Page 27.)

The fixed drying oils are alone used for making paints. They dry by absorbing oxygen from the air, and only those which absorb a considerable quantity are valuable, and of these linseed practically holds the field. Linseed oil is obtained from the seed of the flax. The two chief qualities of linseed recognized in the trade are the Baltic, which grows in the north of Russia, and the Black Sea, which is grown in the south of Russia. The Baltic seed is the best. The East India seed from Calcutta is inferior in quality to the Russian. Linseed oil is often adulterated, principally with mineral and rosin oils, and occasionally with cotton seed, niger seed and whale oils, and there have been many substitutes proposed, but while the price of linseed oil is low there is no particular advantage to be derived from their use. Even for the cheapest work architects will be well advised to rigidly specify linseed oil and give no loophole for the use of any substitute. (Page 26.)

Iron Architecture. SIR WYKE BAYLISS has on several occasions made remarks which show that he is no exception to the general rule that painters do not appreciate what the art of architecture is. They talk glibly either of the poetry of architecture or relegate it to the position of that commercialism generally misnamed "engineering." Sir Wyke Bayliss is kind enough to say that he does not think that architecture is necessarily on the down-grade in England, though he considers that engineering has to a great extent taken its place as an art. What we need now, he says, is a genius who will deal artistically with iron, making it as beautiful as the architects have made stone beautiful in the past. Why not dot the country, he suggests, with poems in iron, as for centuries we have done it with poems in stone? This is all very well, but iron is not a material of pleasing colour or texture, nor so pliable as stone for decorative purposes. Cast-iron, it is true, allows of some variety of treatment, but its use is restricted by the necessity of making a model for the casting. One cannot carve in iron, and it is contrary to the constructive laws of steelwork design to twist and twirl it about. Steelwork has its uses, and when logically employed is architectonic, but it will not fulfil every architectural function. It must and ever will remain but a part of architecture, and under some conditions may be the most important part, but it never can be the be-all-and-end-all of architecture.

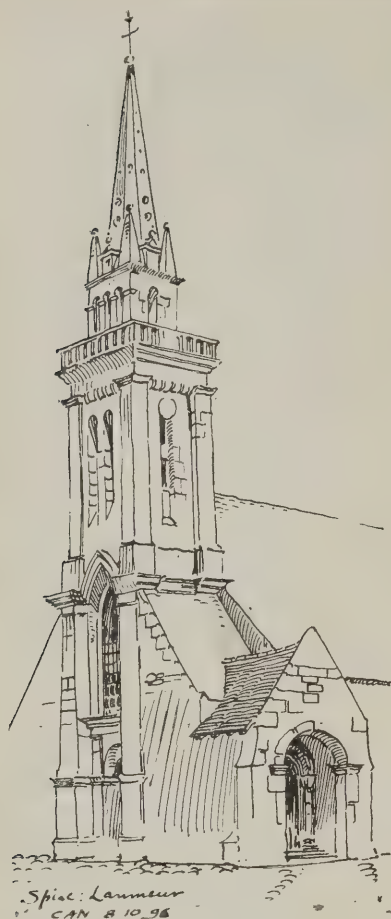
The Hoarding Nuisance.

A CORRESPONDENT of the "Times" calls attention to a subject which, in its general bearing, is undoubtedly of considerable importance to the business community. An unsightly hoarding at the upper end of Charing Cross Road was erected two years ago for the purpose of removing the public lavatories, the cost of which was borne by the Charing Cross, Euston and Hampstead Railway Co., to make room for the underground railway station which they proposed building. This work was completed on July 13th, 1904. In the early part of September last the railway company erected the present hoarding for the purpose of building the underground station, and this hoarding is likely to remain for another eighteen months. Owing to the tunnelling that is going on the road continually subsides and has to be closed to traffic for repairs. Firms having their offices and commercial premises in this thoroughfare naturally object to the loss of trade resulting from this cause. They feel aggrieved that the company can obtain by Act of Parliament the right to injure their business by work which is chiefly to benefit the company's

shareholders. In addition to this trouble the road is blocked with carts loading and unloading. It seems only fair that in such a case as this some compensation should be paid to persons whose interests may be affected. This is but another instance of what is continually going on in building operations, and we cannot see that it is legitimate for people to be interfered with in this way. Where a street is a narrow and busy one building owners should be forced to pay for the cost of keeping the roadway open by taking special precautions to avoid subsidences and the obstruction caused by carts loading and unloading. If carting must be done during business hours the carts should be drawn within the hoarding and the materials hoisted from the interior. The question of scaffolding is not an insurmountable one either, because a platform can be constructed to leave the footpath clear underneath; and when steel frames are adopted, as is now becoming more and more the custom, the scaffolding can be suspended from the framework in the American manner.

Enlightened Criticism.

ARCHITECTS have often bewailed the fact that the daily press neglects architecture, and have wished that modern buildings might be criticized in the same way as the drama and music. For our own part we have looked upon the proposal as rather a doubtful blessing. The profession should recollect that whenever the public has taken a fervid interest in architecture the result has been to set the clock back—the Greek and Gothic revivals, for instance. However, the "know-alls" of the daily press have recently distinguished themselves in criticism of architecture by praising the Hotels Cecil and Russell, and now the "Manchester Courier" publishes the following instructive note:—"In consequence of the growing use of ornamental glazed tiles for architectural decorations, London bids fair to become a city of many colours. We have already some buildings with yellow, blue, terra-cotta and white tile fronts, and now there are springing up in various leading thoroughfares claret-coloured stations for one of the underground electrical railways in course of construction. The magnificent Birkbeck Bank—unfortunately hidden in a side street—set the fashion for glazed tile architecture, and if this model, which is a beautiful structure with a higher standard of artistic taste, had been followed all would have been well. But many of our tiled buildings are outrageously gaudy. Though this cannot be said of the new claret-coloured railway stations, these edifices are far from picturesque and quite out of harmony with their surroundings."



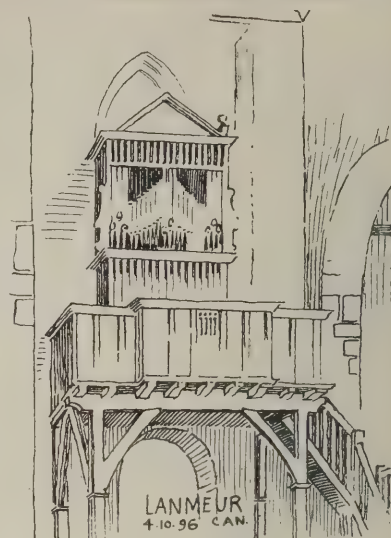
VILLAGE ARCHITECTURE IN FINISTERE.

THE bleak countryside north of the town of Morlaix recalls in its natural features, in its history and in its people the "Old Cornwall" across the Channel which has been so lovingly described by John D. Sedding in one of his essays on art and handicraft. In both provinces are the same granite rocks, the same bleak and romantic landscape, the same austere and uncouth art, the same mingled tradition of Christian faith and heathen superstition. The names of Cornish villages and Cornish saints are to be found in Brittany; the Cornishman and the Breton are of the same race and temper; they follow similar callings, and till recently spoke similar dialects. It is useless to look for architecture of the more elaborate kind in a country which can never have been wealthy, where the staple material is granite, and where it is a difficult matter to build snugly and tightly against the keen weather. Even in the cathedrals of Brittany there are no daring feats of construction nor wealth of delicate ornament such as may be found in France, Germany or England. Yet, though Breton buildings are often small and unpretentious, and always sternly practical, there is in some of them that air of distinction which belongs to all work that is a little more solid, a little more ornamental, a little more lofty or spacious than bare necessity demands—a quality depending in a very small degree upon the actual size or cost of a building, for it exists even in some of the homely churches of Cornwall; in one it is due to the scantlings of the masonry, in another perhaps to the restrained and severe outlines of the exterior, and in a third to the wealth of carved woodwork within.

The Breton church is built somewhat upon English lines; apsidal ends are rare, even the cathedral at Dol having a square east end with a large traceried window. At Dol, too, many of the abaci are circular and

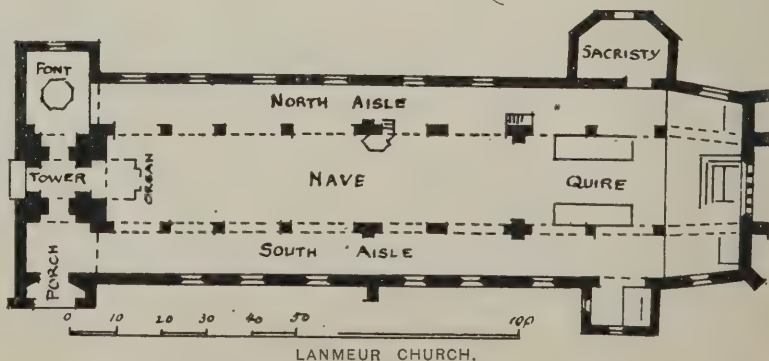
carved with English-looking stiff-leaved foliage; the nave piers have detached shafts, and the general feeling of the interior, with its strongly marked tower arches at the crossing, is decidedly English, except in the matter of relative height, its proportions being loftier than those of the average English thirteenth-century cathedral. Besides possessing the English feature of the square east end with its large window, the Breton churches, like those of our own West Country, are often built without chancel arches, though they are ordinarily roofed with lean-to aisles instead of in three nearly equal parallel spans in the Cornish manner. Consequently the aisles are narrower in proportion to the naves than they are in Cornwall, and the roofs as a rule are a good deal loftier and more prominent.

There are two good-sized churches in the town of Lanmeur—the larger a simple aisled oblong with a Romanesque crypt and a western steeple. It is an absolutely plain piece of engineering, with unmoulded round arches, square piers, and a timber roof. The arches are of varying spans and height, the side windows plain round-headed openings, and the east window elliptical-headed and filled with poor tracery. There is some primitive carving in the crypt, which is absolutely dark, and a little interesting detail in the screens and fittings of the baptistery and in the pretty organ in its equally charming loft at the west end. In spite of the bald-



ORGAN LOFT.

ness and utilitarianism of its architecture, and in spite, too, of modern improvements, this interior is dignified and church-like, for its builder, not having had the means to build ornamentally or massively, has wisely refrained from attempting to hide his poverty under a transparent cloak of shoddy ornament-





CHURCH OF NOTRE DAME DE KERNITRONN, LANMEUR.

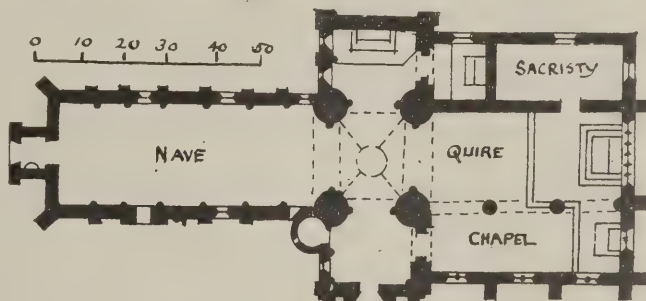
ation. Outside, there is something fine about the seventeenth-century steeple and the bold outlines of the church, and there is a large plain Romanesque doorway in the south porch. But this, which appears now to be regarded as the principal of the Lanmeur churches, is less interesting and less instructive than the fine late Romanesque cruciform building known as Nôtre Dame de Kernitronn, which stands a little outside the village on its west side.

Built apparently at the close of the twelfth century, this church has the peculiar charm belonging to most transitional work, that very human quality of an ideal only partially realized which one so often misses in the more perfected styles. And if the larger church at Lanmeur shows how men may build cheaply and yet inoffensively, Nôtre Dame de Kernitronn is an equally valuable lesson in the far more difficult and nobler art of building with restraint and dignity and yet at the same time ornamentally.

Of the original building, the nave, transepts and central tower remain much as their designer left them, the chancel and the western bay of the nave having been rebuilt sometime in the thirteenth or fourteenth century. A good deal of the dignity of the building is no doubt due to the severe simplicity of the planning; for though the church is by no means a large one, the entire internal length being even now only 120 ft. in spite of its enlargement, the absence of aisles and the unbroken height of the walls give both the interior and the exterior a monumental character, stamping the building as something important and out of the common.

There are two great Romanesque doorways outside—one on the south side of the nave, the other at the end of the south transept. The outside of the nave has tall flat buttresses, measuring 1 ft. gins. by 6 ins., spaced on the average 8 ft. centre to centre, and corresponding to these, inside the nave, are tall slender shafts with foliated caps carried up to the tie-beams. The nave has plain tie-beams and a wooden barrel ceiling; but the transepts are vaulted in stone with heavy pointed barrel-vaults and large square ribs carried on shafts like those in the nave.

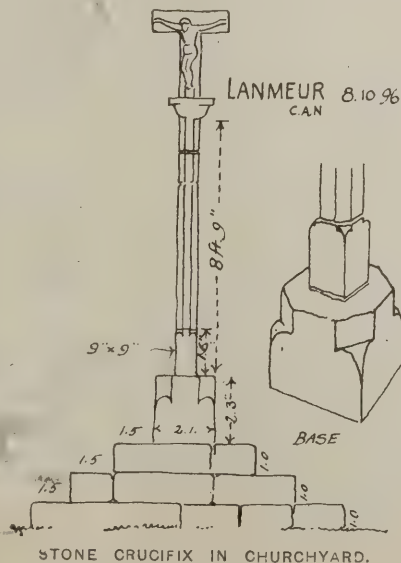
The crossing is groined with ponderous moulded ribs quaintly finished with scroll ends around the belfry hoist, and the four heavy pointed tower arches spring from great circular piers 6 ft. in diameter, with small attached shafts. The tower itself is carried up quite plainly, with two small belfry lights on each face, and is fittingly crowned by a low slated spire. Although there is no sculpture in the church except some time-worn figurework in the doorways and unimportant carving in the capitals, the building is unmistakably an ornamental as opposed to a merely utilitarian one. Like Durham or Waltham, it proves that the art of building is of itself sufficient to create a beautiful object without the added graces of painting or sculpture. Undoubtedly the union of all the arts, when duly ordered, must always produce a nobler result than can be obtained from the resources of the building art alone;



still, work like this at Lanmeur shows that, when circumstances prevent, as they sometimes must prevent, a builder from working in co-operation with good painters and sculptors (and all but the good ones are anathema) he need not necessarily, in despair of attaining the beautiful, content himself with aiming at the merely "pretty" or the "picturesque."

The later portions of Nôtre Dame are good of their kind, though they miss the vigour and earnestness of the early work. These additions have the great merit of clearly showing their date, being built in granite ashlar, while the older parts of the church are in rubble. The whole, too, groups well together and has a beautiful setting of fine trees. In the churchyard is a stone crucifix of about the same date as the chancel, and the churchyard gateway is cleverly arranged with curved walls and big stone piers with balls on the top. North of the church is a cemetery with an excellent modern crucifix, the graves in this cemetery being unusually arranged, at right angles to the axis of the church. It must, unfortunately, be added that the whole interior of the church has been restored and painted with "oil cloth" patterns executed in crude colours, and that all the old fittings of interest have been swept away.

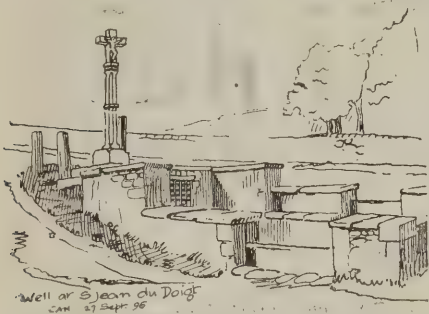
Lanmeur is a dull and rather prosaic-looking country town, to which no greater contrast could well be imagined than the romantic village of St. Jean du Doigt, about three miles away, planted at the bottom of a little valley sloping down to the seashore. St. Jean du Doigt is a place of no small importance, since its church contains a finger of the Baptist, which finger has caused healing



STONE CRUCIFIX IN CHURCHYARD.

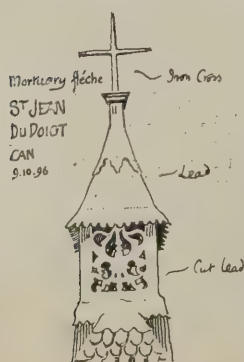
springs to flow from the hills above the village, whose waters are potent to restore the blind their sight, and which certainly make the valley an oasis in the waste of bleak uplands that lies between Morlaix and the sea.

At the annual "pardon" the village is crowded with pilgrims from all the countryside, and during the bathing season it is alive with French "trippers," but at other times it is a quiet sleepy place with an atmosphere of faded greatness in its big church and its sturdy old houses. At the parting of two roads on the hillside north of the village is the source of one of the miraculous iron springs which have been mentioned. This is enclosed with low stone walls having stone seats and a niche over the head of the spring; close to it stands a tall wayside crucifix rudely carved with a figure of Our Saviour on one side and a standing figure on the other. It is altogether a



charmingly treated fountain of the simpler sort, and the stonework looks about 250 years old. A far finer and more elaborate fountain stands in the churchyard. This consists of a very large simple stone basin with a smaller one rising out of it; above is a delicate piece of leadwork with figures of the Almighty, the baptism in Jordan, and the donor, the last named in knee-breeches and long-skirted coat. The whole is Renaissance in character, but of more delicate workmanship and more refined proportion than most work of its date in the neighbourhood. The natures of the various materials used have been thoroughly appreciated by the artist who made this fountain; the stonework is broadly and simply treated, forming an excellent foil to the dainty metalwork above, while the sparkling jets of water are so arranged as to contribute in no small degree to the general effect.

Beside the fountain is the large stone gateway of the churchyard. Its main arch has a rich crocketed canopy with climbing beasts carved on its flanking pinnacles, and above are two niches of slightly different designs, the simpler one containing a weather-beaten stone bishop, the more elaborate a delicately-carved figure in oak, possibly representing the builder of the gateway or some benefactor of the church. Close to the south porch of the church itself stands an open-sided seventeenth-century chapel with an enormously high slated roof finished with an open-work lead turret. Such mortuary chapels are not uncommon in the neighbourhood, and this at St. Jean du Doigt is a characteristic specimen. Its sides have square balusters of granite standing on a moulded and fluted granite plinth; the roof, resting upon granite lintels, is framed in the old Gothic manner with curved braces and moulded purlins with bosses at the inter-sections; it is ceiled to the



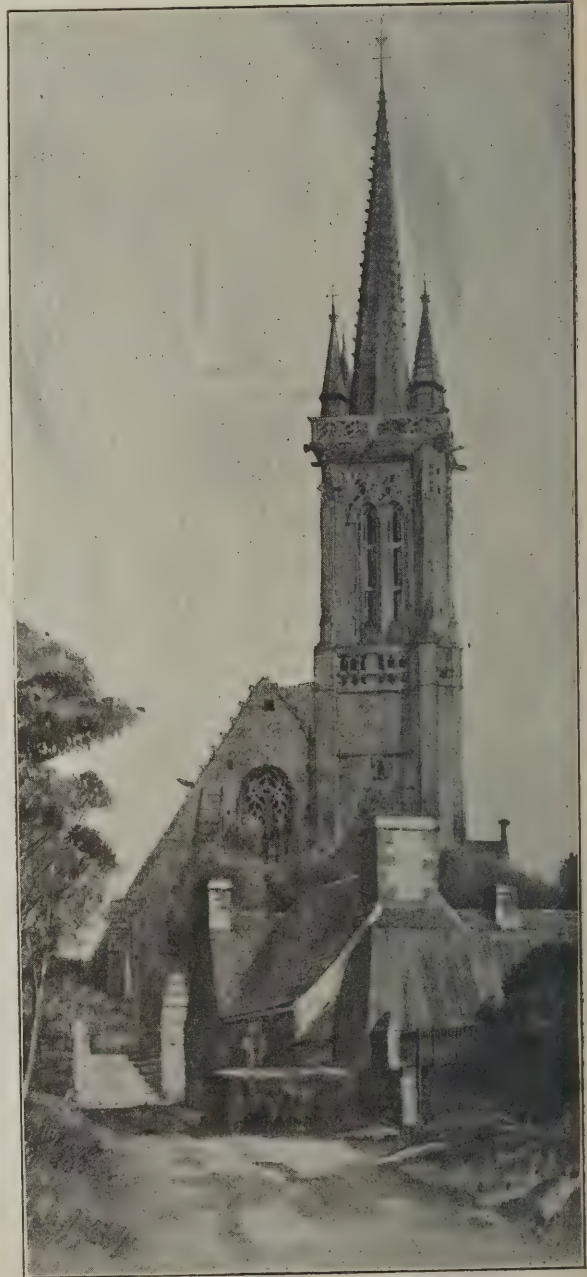
line of the curved braces, and at the east end is formed into an apse which contains a small stone altar below an open oval window.

The church which forms the dominant feature of this extraordinary group of buildings is comparatively of small size, being only 110ft. by 44ft. inside. It is built on the simplest possible plan, a mere aisled oblong with a tower at one corner and a porch and a transept on the south side. Yet inside and out the building strikes one as both novel and unusual. There is even a sense of experiment and amateurishness about some parts of the church; it is conspicuously and even aggressively bold and pictorial, the very antipodes of our own great sober parish churches in England with their homely square towers and their business-like aisles and clearstories. Though it covers so small a space of ground, the building, owing to its great height and striking treatment, is unmistakably something more than an ordinary parish church; like the "Sainte Chapelle," it is a great reliquary, and whereas generally the country church has grown up with the growth of the village and has been enlarged and adapted over and over again to meet the growing wants of the villagers, here it would seem, that the village has grown up around the church. The building has a large south porch with a high-moulded entrance arch, a groined ceiling and a double inner doorway on the central pillar of which is a carved niche with triptych-like glass shutters enclosing an old painted statue. East of the porch is a small transeptal chapel, and between the porch and the tower the eaves of the aisle are finished over an open-traceried overhanging gallery which, but for its detail, would not look out of place in Padua. The tower is of characteristic design. Built with very deep angle buttresses, its sides are plain up to the belfry level except for a series of traceried "triforia" corresponding with the eaves gallery of the aisle. The belfry has long coupled lancets on each face; above these there is a pierced parapet within which rise the spire and its four pinnacles, all of wood covered with lead. Between the buttresses at the base of the tower are two lean-to charnel-houses, that on the south being of mediæval and that on the west side of seventeenth-century character. The aisles of the church are of considerable height, and a sharply-pitched slated roof covers the whole building in one great span. The west front is treated in a skilful manner so as to convey an impression of great height, and the tall four-light west window is filled with graceful flamboyant tracery under a round arch. The west doorway is comparatively simple and unimportant, but it retains its original doors with effectively arranged panelling. The east window is filled

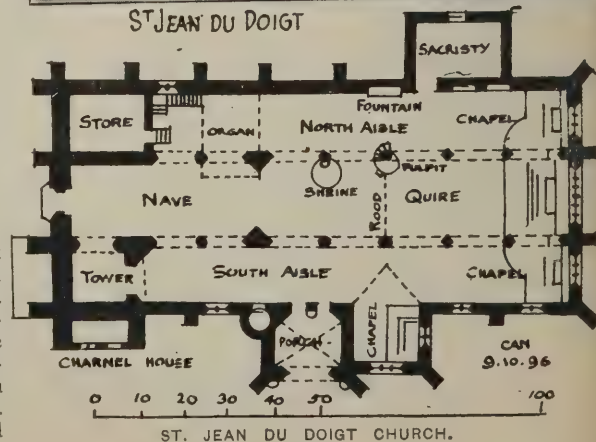
with unsatisfactory geometric tracery of late date, and there is but a single window in the north aisle.

The internal arcades are unusually tall, some of the pillars being plain octagons, others regular Perpendicular clusters like those in New College ante-chapel. Half-way down the nave there is a large clustered respond on each side; these look as if they had been built to carry a transverse arch across the nave.

One cannot but admire the strangeness

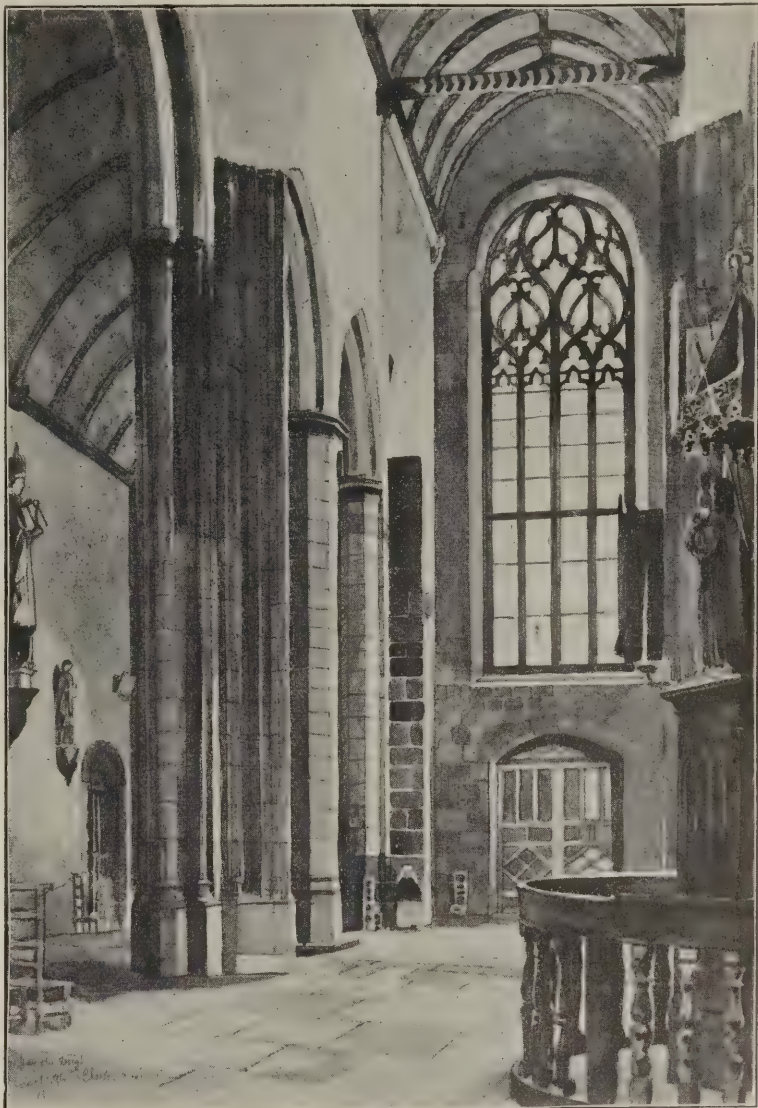


ST JEAN DU DOIGT



ST. JEAN DU DOIGT CHURCH.

and stateliness of such an interior, sinning as it does against the received canons of architectural proportion. We moderns, who build perforce like pigmies, may well envy the creator of such a church, unfettered by the fads of committees or the cast-iron regulations of Incorporated Societies and Ecclesiastical Commissions. The church of St. Jean du Doigt compels worship; its stones preach an enduring testimony to the Faith—and who shall dare to say that such a building fulfils the purpose of a church less efficiently than the most “handsome” and “convenient edifice” where the Chinese puzzle of providing an impossible number of seats within sight and sound of altar and pulpit has been most nearly solved, and where necessary makeshifts have been most successfully disguised beneath the lion’s skin of mediævalism. The building too is fortunate in having been spared the agonies of a French “restoration,” and though in a rather mouldering and decayed condition, it still contains a good deal of old furniture. The baptistery under the tower is screened with charming mediæval parcloles consisting of plain diagonal balusters between moulded rails, all coloured and gilt. On one of the nave piers is a trophy of banners, under which stands an old painted and gilt image of St. John in a kind of shrine enclosed with a circular balustrade of seventeenth-century work, the top rail of which is cunningly contrived as a money-box for the sous of the faithful. Perched up in an odd little gallery in the north aisle is a small Renaissance organ case with a large painting in front of King David and St. Cecilia and a heavenly choir, not perhaps a very fine work of art but pleasing enough in its faded bravery of colour and simple and telling in its drawing and arrangement. The altars have great rococo marble and stucco reredoses with clumsy Corinthian columns and ponderous imagery, ugly in themselves yet possessing a certain dignity and largeness of treatment which, now that time and dirt have softened the details, would make one sorry to see them altered. At the chancel entrance is a



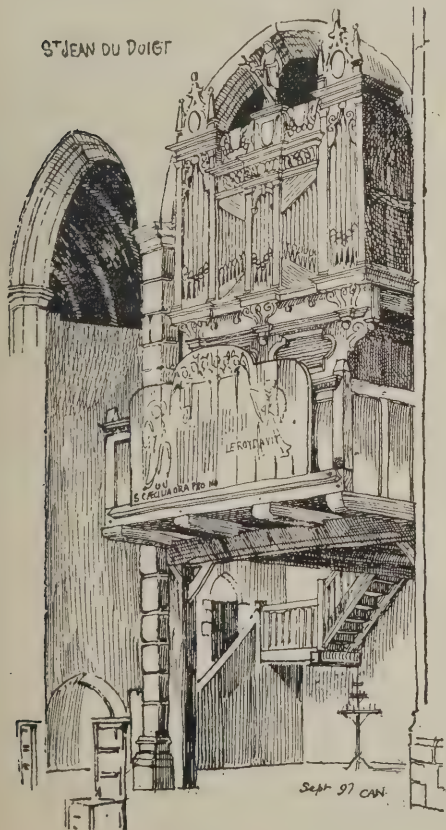
ST. JEAN DU DOIGT CHURCH.

plain Renaissance rood beam, with painted images and pretty scrollwork at the base of the rood. There is a trough in the north aisle filled with running water from the miraculous spring, and the sacristy contains good store of gold and silver treasures.

The church roofs are well-preserved specimens of a type common in the district. The nave has a pointed-arched wooden barrel-ceiling with moulded ribs close together and a single ridge rib with carved bosses, and plainly chamfered tie-beams, the wall-ends of which are carved with dragons’ heads holding the beams in their teeth. The lean-to aisles have half-arched ceilings corresponding to that of the nave. All the boarding is painted blue and powdered with white stars; the dragons are fiercely green, with vermilion lips and very white teeth; and the tie-beams, wall-plates and ribs are painted in a variety of chequer patterns in dark red and white. The wall-plates in the

aisles have carved angels and beasts, standing out hammer-beam fashion, and in the south chapel is a delightful carved cornice of vine leaves and grapes, looking as if it had come out of some Cornish or Devon workshop.

Beside the churchyard gateway is a large old building, formerly a pilgrims’ hostel,



ORGAN CASE.

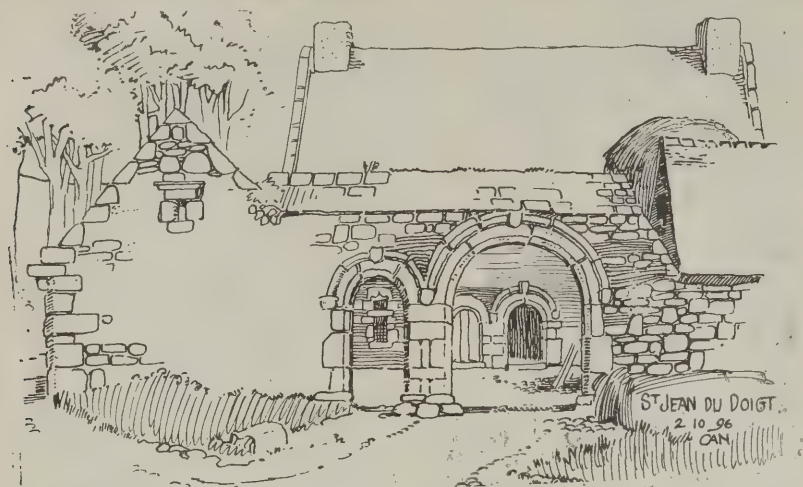


Hostel St. Jean du Doigt



THE STABLE.

The Hostel
ST. JEAN DU DOIGT.
CAN 22996



ENTRANCE TO FARMYARD.

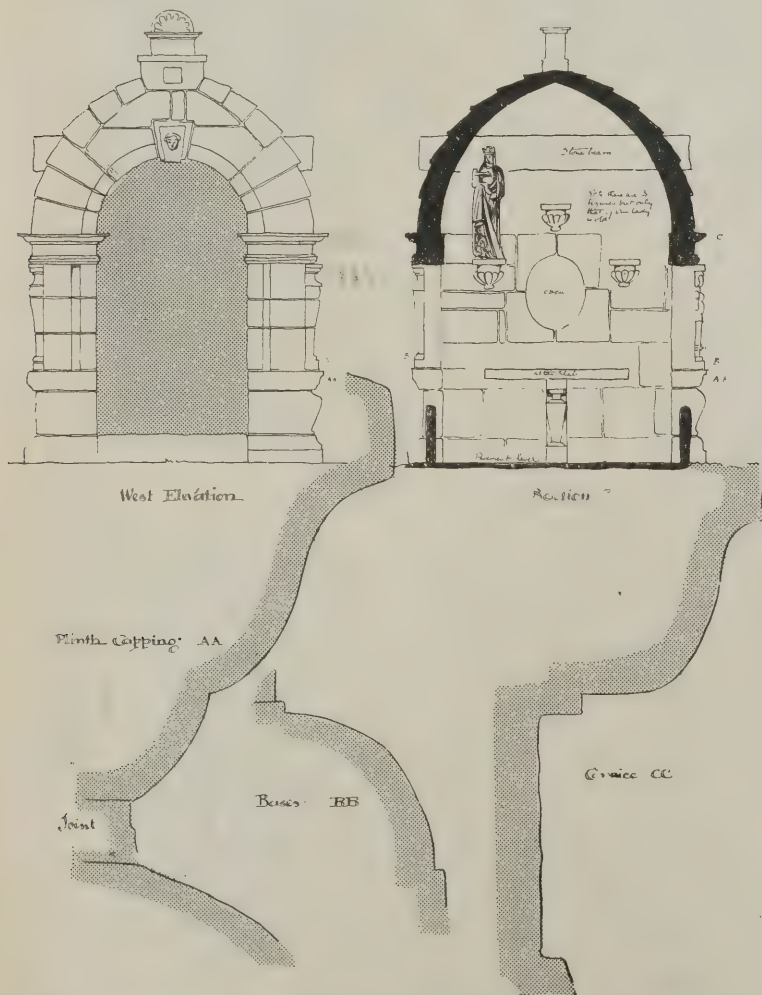
which is said, like most of the later Gothic work in the neighbourhood, to have been built by Anne of Brittany. Whatever may have been its origin, its stately outlines and carefully-built masonry are sufficient proof that it was designed to serve no mean purpose. The main doorway has flanking pinnacles and a crocketed canopy in granite, and there is a delicate cornice of running foliage forming a corbelling on one side. The windows have ashlar quoins, and the whole treatment is distinctly large and important. The eastern wing of this building appears to be an addition, and at the west end of it, near the churchyard gate, is a detached chapel-like "annexe," now used as a stable. The

hotel opposite to this has remains of mediæval work in its doorway, though the rest has been modernized; in a granite country like that round Morlaix people seem to think twice before they pull down their houses, and it is therefore likely that many buildings in the district are substantially of mediæval date, though some of them have been altered beyond recognition. Perhaps it may be owing to the character of the staple building material that men still build there in somewhat of the old manner, and that a small spark of the old building tradition has been kept alive to the present day.

Just outside the village, on the side of the narrow lane that leads to Plougasnou, is a complete late Gothic farmstead, the house retaining its original doors and windows, the farmyard forming a quadrangle in front entered by a splendid double archway. The group forms a charming picture with its backing of tall trees and its sturdy weather-worn granite masonry, which looks as if it would last for ever. Beyond these farm buildings the lane becomes a steep narrow pathway leading on to the plateau surrounding the valley of St. Jean. At the top of the hill is another small farmstead with a huge wooden cross painted red, and just beyond it a curious little open-sided oratory, dated 1611, built with caryatid pilasters on two sides and roofed with a pointed arch of granite having large granite tie-beams. Over its small stone altar are brackets bearing images, that of the Madonna being apparently original. The corresponding figure was brought from Plougasnou Church. The village of Plougasnou lies just beyond the oratory, about a mile and a half away from that of St. Jean du Doigt. The houses here are mostly of the seventeenth and eighteenth centuries, very simple and restrained. Some of the outlying ones are more ambitious, with quaintly-treated porches and covered wells in their gardens.

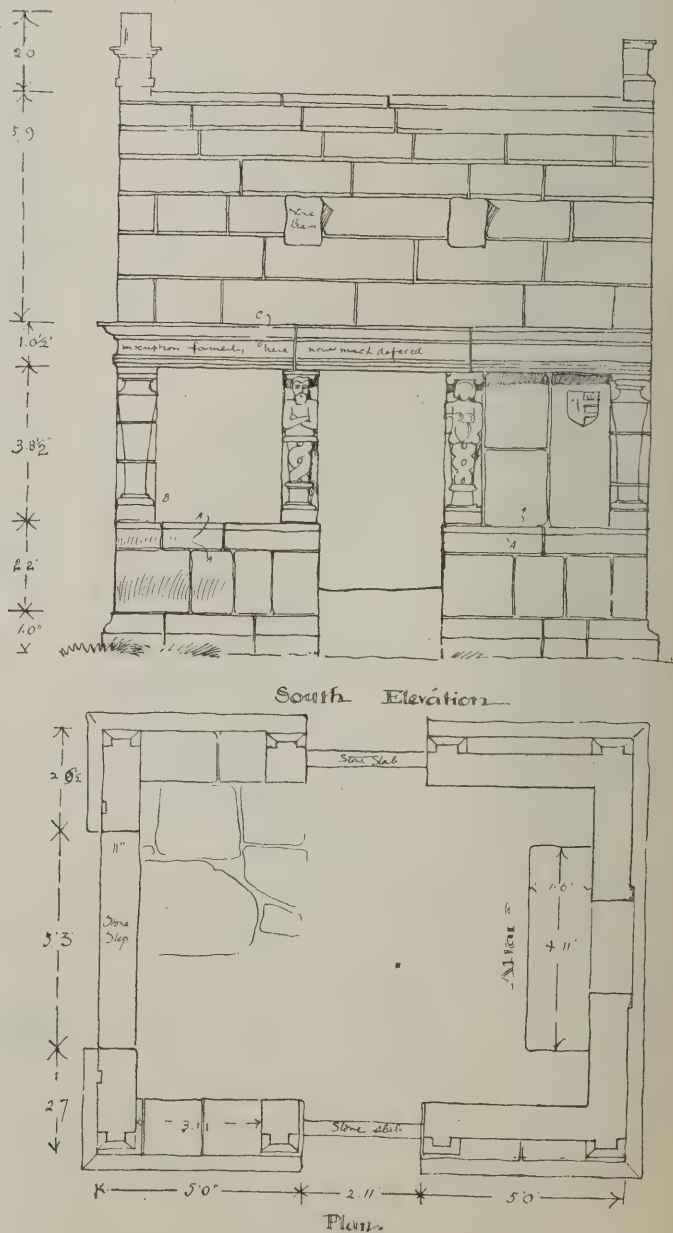
C. A. N.

(To be concluded.)



ORATORY AT PLOUGASNOU.

(Material: Dressed granite: joints flush, averaging $\frac{1}{2}$ in. to $\frac{3}{4}$ in. wide. The floor is roughly paved. There are no caryatides on the north side, but plain pilasters similar to the outer ones on the south side. Dated 1611. There are remains of crosses on the east and south sides, a short distance from the Oratory.)



Keystones.

A Stained-glass East Window has been placed in Heydon Parish Church.

A new Lighthouse is to be erected on Brothers Island, in the Red Sea, to replace the present structure.

Three new Bridges are to be constructed over the Ibrahimieh Canal at Manfalout, Beni Kora and Nazali Saoub at a cost of about £25,000.

Housing Schemes now in course of progress by the London County Council will displace 4,794 persons, provide accommodation for 5,064, and cost altogether an estimated sum of £524,000.

A Carnegie Library at Wombell is being erected. The architect is Mr. H. L. Paterson, of Sheffield, whose design was chosen from among nine competitors. The contractor is Mr. William Johnson, and the building is to cost £3,100.

A Roman Catholic Presbytery at Brentford, of ten rooms, has been erected. The priest-in-charge drew up the plans, did the surveying, acted as clerk of works, and laid out the gardens. The chief portion of the labour was done by male members of the congregation.

The new Bridge over the Wear at Sunderland is to be a "two-deck" structure, and will cost the North-Eastern Railway Co. £300,000. When the new high-level bridge over the Tyne and that over the Wear are complete the railway system from the Tyne to the Wear will permit of much better working than is possible at present.

The Church Army's new Headquarters has been completed. The building has two frontages—one in Edgware Road and the other in Bryanston Street, W. The latter frontage is built of pressed red bricks, with stone dressings, to harmonize with the Men's and Women's Training Homes adjoining. The roof is flat and railed in. The total cost has been £40,000.

Darvel Town Hall has been completed at a cost of £5,000. The façade of the building has been carried out in stone, designed in a free Italian Renaissance style. The main hall has a frontage of 55ft. and a depth of 160ft. There are also provided a council-chamber and lesser hall. The contractors were Messrs. Robert Mair & Sons, of Darvel, the architect being Mr. T. H. Smith, of Basinghall Street, London.

A large Turret Clock at Warley Church, Halifax, has been completed by Messrs. W. Potts & Sons, of Guildford Street, London, from the designs and plans of the late Lord Grimthorpe. The same firm are also making a large illuminated Cambridge quarter-chime clock and a set of bells for the Carnegie Free Library, Clitheroe. They are also constructing a clock, chimes and bells for St. Patrick's Cathedral, Dundalk, Ireland.

The new Nurses' Home in Fulham Palace has been completed. On the entrance floor, which is in mosaic work with tiled dado, are the assistant matron's room, sisters' and nurses' sitting-rooms, library, spare room and six bedrooms. The first and second floors consist of bedrooms and offices, painted in pale green or salmon tint. The basement contains the usual offices. The hot-water apparatus has been installed by Messrs. J. & F. May, of Whetstone Park; the electrical appliances, wires, &c., by Messrs. Cash & Co., of Westminster; and the electrical fittings by Messrs. Sotheby & Co. The terrazzo floors and tilework have been executed by Messrs. Simpson & Co., while Messrs. Doulton & Co., of Lambeth, were responsible for the sanitary fittings. The architect was Mr. A. Saxon Snell, of Southampton Buildings, London, W.C., and Messrs. Cowley & Drake, of Willesden Green, were the builders.

A Gordon Highlanders' Memorial has been erected on the Castle Esplanade, Edinburgh.

The Restoration of Wymondham Parish Church, begun in 1901, has been completed. The total sum expended has amounted to £19,935.

The County Fire Office and Provident Life Co. have opened new offices at Glasgow. The building, which is free Classic in style, was designed by Mr. R. A. Bryden.

A.A. Students' Designs.—The designs of students at the Architectural Association School of Design, together with the prize drawings, are on exhibition this week at 18, Tufton Street, Westminster, from 10 to 7.

Admiralty Works at Whale Island.—We understand Messrs. Patman & Fotheringham, Ltd. (James F. Parker, managing director), of Theobald's Road, W.C., and Park Street, Islington, N., are making excellent progress with the officers' quarters, &c., at Whale Island, Portsmouth, for the Admiralty.

Arts and Crafts Exhibition.—The ninth annual exhibition of work executed during the past session by students of the London County Council Central School of Arts and Crafts will be held at 316, Regent Street, W., on Thursday, Friday and Saturday, July 13th, 14th and 15th, from 10 till 8 each day. Admission is free on signing the visitors' book. The work on view comprises artistic work in bookbinding, stained-glass, gold and silversmiths' work, metal casting, enamelling, die-sinking, engraving, cabinet work, carving and gilding, embroidery, writing and illumination, lithography and woodcuts, architectural design, furniture design, drawing, modelling, and design for various processes. There will also be shown a selection of drawings by pupils of secondary schools aided and inspected by the Council.

The Manchester Society of Architects visited on July 1st two recently-built houses at Knutsford, "Bexton Croft," for Mr. D. Macpherson (Mr. M. H. Baillie Scott, architect), is a simply designed house, built with a keen sense of the value of the picturesque. "Woodgarth," for Mr. George Wragge (Messrs. Thomas & Percy Worthington, architects), has great architectural charm, and was illustrated in our issue for March 8th last. Afterwards some sketches were made of Bexton Hall, a simple old red-brick farmhouse, with a certain stateliness in its symmetrical front crowned by a large octagonal lantern, and approached through an enclosed forecourt. The Society has also made an evening visit to Oldham to see additions to two houses for Mr. William and Mr. James Dronsfield (Mr. J. Henry Sellers, architect).

Reform of Local By-laws.—Several architects (including Mr. Christopher Turner, of Wragby, Lincs., and Mr. Thackeray Turner, secretary of the Society for the Protection of Ancient Building) recently gave evidence before the Select Committee of the House of Lords on the Public Health Acts (Amendment) Bill to the effect that the restrictive nature of the existing building by-laws seriously interfered with landowners who desired to assist those working on the land to better houses, especially where economy was an object. The scarcity of buildings in which to house agricultural labourers properly was one of the great causes of rural depopulation. Many more people would be on the land if they had better houses. One witness put the excess of cost of building by reason of the by-laws at 20 per cent. Moreover, the bother involved was such that landowners in many cases would not build at all until the by-laws were modified. Complaint was also made that certain local authorities, instead of helping, hampered and even stopped altogether every attempt on the part of landowners and others interested in rural housing.

The Birmingham Dental Hospital, in Great Charles Street, was opened last week by Sir Oliver Lodge. Messrs. Bateman & Bateman were the architects.

Mr. J. D. Sutcliffe's Paper on "The Practice of Ventilation," which has already appeared in our columns, has been issued in pamphlet form with a number of additional illustrations by the Sutcliffe Ventilating and Drying Co., Ltd., of Cathedral Corner, Fennel Street, Manchester.

Cobham Cottage Hospital has been erected at a cost of £1,250. The building is cream rough-cased, with red-tiled roof and green painted exterior iron and woodwork. The designs were prepared by the late Mr. F. W. Bedford, F.R.I.B.A., and carried out by Mr. George Kyle, of Ripley and Cobham.

Competitions.

A Cottage Hospital Competition.—Architects will be asked to compete for the new cottage hospital to be given to Port Glasgow by Mr. and Mrs. John Birkmyre. A suitable site has been obtained from Sir Hugh Shaw Stewart of an acre and three-quarters. Twenty-two beds are desired. The sum set apart for the construction work is £10,000.

Wincobank Housing Scheme, Sheffield.—The Housing Sub-committee of the Sheffield Corporation recommend the adoption of the plan of Mr. H. L. Paterson, the successful competitor in the recent competition for twenty houses at High Wincobank, and the adoption of the tender of Mr. Nathouse, builder, for the erection of the houses at a cost of £2,520. The competition, it will be remembered, was for the erection of houses to be let at 5s. per week clear, without any charge on the rates. Mr. E. M. E. Gibbs was the assessor in the competition.

Branch Libraries at Cardiff.—Mr. H. V. Lanchester, the assessor in the competition for branch libraries at Canton and Cathays, Cardiff, towards which Mr. Carnegie has given £10,000, has made his award as follows:—Cathays library—first (£75), Allen, Speir & Beavan, Cardiff; second (£50), E. M. Bruce Vaughan, Cardiff. Canton library—first (£75), E. M. Bruce Vaughan; second (£50), J. Allen, Speir & Beavan. The buildings are not to cost more than £4,750 each, the balance of £250 being required for fittings. Twenty designs for each library were submitted.

New Mitchell Library, Glasgow.—Seventy-six sets of designs have been submitted in competition for the new Mitchell Library buildings to be erected in North Street, Glasgow. Forty-two were first selected for thorough examination, and then a short list of seven, which were submitted to the measurer. The assessors, Mr. John Keppie, F.R.I.B.A., and Mr. A. B. MacDonald, City engineer, have awarded the first place to design numbered 32, cost £44,479; the second to design numbered 47, cost £41,900; the third to design numbered 21, cost £42,994; and the fourth to design numbered 55, cost £48,425. In their opinion the architectural merit (especially with regard to the North Street front) of No. 47 is greater than that of No. 32, but in plan No. 32 is superior to No. 47. The design of Mr. William B. Whitie, of Glasgow, has been selected.

Obituary.

Mr. John Boldero, master-builder, of 149, Seven Sisters Road, London, died suddenly recently, aged 41.

Mr. William Kerr, architect, of Ayr, died recently after a short illness. He was engaged in the erection of an addition to the Kyle Union Poorhouse at a cost of £12,000.

THE TIMBER TRADE.

The London Market in June.

NO improvement can be recorded in the London trade for the month of June, and the deliveries from landed stock have fallen off again by something over 2,000 standards, but this is to some extent compensated by a better delivery over side. Messrs. Churchill & Sim state that the trade has been very retail and unprofitable as a whole, except for the smaller-sized battens and floorings, of which the stock is not excessive. The White Sea shippers again made reductions in their prices in order to effect wholesale business; but this has not been followed by any concessions from the Swedish side, where shippers are still inclined to hold for full prices. The month closes with a slightly improved enquiry here and there in the country generally, London excepted, and a prospect of a plentiful supply of tonnage at considerably less than what are known as "conference" rates.

The volume of business during June suffered by the Whitsun holidays (Messrs. Denny, Mott & Dickson, Ltd., state) and the general tone was dull. The half-year as a whole has, however, developed a steady confidence in the soundness of the position all round, and a well-founded belief that the general business of the country is expanding and that the timber trade industry will surely, if slowly, benefit thereby.

The abstract of dock stock, consumption, &c., for June, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on June 30th was—

	Pieces.
Foreign deals and ends - - -	990,000
Do. battens - - -	1,681,000
Pine deals and battens - - -	896,000
Spruce do. do. - - -	640,000
Boards, rough - - -	2,903,000
Do. prepared - - -	5,902,000

Totalling 13,012,000 pieces, as compared with 15,437,000 in 1904, 15,657,000 in 1903, and 18,084,000 in 1902.

In other kinds the stock was as follows:—

Foreign wainscot logs - - -	95 pieces.
Do. oak timber - - -	526 loads.
Do. fir timber - - -	203 do.
Do. Oregon pine, &c., spars and masts - - -	4,015 do.
Colonial oak timber - - -	1,276 loads.
Do. birch timber and planks - - -	1,788 do.
Do. elm and ash timber - - -	503 do.
Do. yellow pine - - -	246 do.
Do. red pine - - -	177 do.
United States pitch-pine timber - - -	15,500 do.
Do. do. deals - - -	44,000 pieces.
East India teak - - -	7,932 loads.

The deliveries for the first six months have been of—

	Pieces.
Foreign deals and ends - - -	1,589,000
Do. battens - - -	2,981,000
Pine deals and battens - - -	553,000
Spruce do. do. - - -	781,000
Boards, rough - - -	2,817,000
Do. prepared - - -	7,682,000

Totalling 16,459,000 pieces, as compared with 18,200,000 in 1904, 19,109,000 in 1903, and 19,977,000 in 1902.

The deliveries for June

were as follows:—

	Pieces.
Foreign deals and ends - - -	198,000
Do. battens - - -	371,000
Pine deals and battens - - -	75,000
Spruce do do - - -	94,000
Boards, rough - - -	283,000
Do. prepared - - -	1,140,000

Totalling 2,161,000 pieces, as compared with 2,616,000 in 1904, 2,510,000 in 1903, and 2,688,000 in 1902.

Deliveries from Ship to Craft.

The deliveries direct from ship to craft for the first six months of the year have been:—

	1905. P.s.h.	1904. P.s.h.	1903. P.s.h.	1902. P.s.h.
Deals and battens	33,627	33,165	34,038	30,870
Boards - - -	9,739	7,356	11,737	11,452
Total - - -	43,366	40,521	46,675	42,322

and for June—

	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens	17,589	17,679	13,412	16,766
Boards - - -	3,754	2,524	4,470	4,676
Total - - -	21,343	20,203	17,882	21,442

Soft Woods.

Sweden.—Messrs. Churchill & Sim state that the importation of deals and floorings has been a normal one, but only about half the usual quantity of battens has come forward. Prepared boards have sold well, the demand for them seems to have recovered somewhat, and the stock remains very light. Swedish deals are scarcely fetching the lowest cost prices of the season after freight and charges have been provided for. The utter lack of demand for the larger sizes is responsible for this unsatisfactory state of things.

Norway.—Norway has sent forward more scantlings and battens and fewer floorings than usual in June. The import for the six months has, however, been practically the same as last year. Flooring prices are inclined to harden on a better market caused both by a stronger demand and a present reduction in the stock.

Russia.—There is a want of confidence as regards the stability of prices of White Sea deals which has tended to make operators very nervous and disinclined to enter into fresh purchases. Prices on the other side were reduced during the month, and are probably by now fairly low enough intrinsically, but the lack of demand in this market has strengthened buyers in their resolve to refrain from adding to their costly stocks, even at the tempting reductions now offered to them. A small importation may be the result and, unless the demand improves, probably the best for the market.

Finland.—With only a normal importation prices have kept quite steady during the month, and in the smaller-sized battens even a slight improvement may here and there be noticed.

Prussia.—There is hardly any trade for fir timber in the docks, and the importation for special works has lately been even smaller than usual. Oak is in poor demand, but prices are quite firm.

Canada.—There is no improvement to be noticed in the prices obtainable for pine deals, and in spite of practically no importation during June the stock remains ample for the poor demand for them. Unless there is more enquiry during the next few weeks the outlook for the season is not promising for those producers on the other side who have not yet quitted their stocks. The shipments of spruce have been below the average so far, but quite enough to meet the reduced demand, and sales have been hampered by some cheaper quotations from the Lower Ports. These quotations are not yet suffi-

ciently tempting for London buyers, and the market is consequently rather at a standstill. The demand for all timber has been poor. Only one cargo of sawn timber has arrived during June to freshen up the stock, which, considering the demand, is really ample. There is no appearance of lower values on the other side; rather the contrary, for the demand from markets other than European continues unabated. A few more deals have arrived during the month and have met with a good enquiry.

Mahogany.—Business in this market continues to fall away, both imports and deliveries into consumption being on a small scale. The imports continue to be so light as to stiffen prices, notwithstanding the small consumption; but the shrinkage in the volume of the mahogany trade in London is increasingly apparent and disadvantageous to both merchant and dealer.

Odessa Oak.—The recent imports of this wood have been of a very standard of quality, and have found a ready market. The position of this wood with consumers is the more assured as it continues to be tested, and the enquiry for it continues to widen out at a rate which promises to exceed the supply.

TESTING A REINFORCED CONCRETE FACTORY.

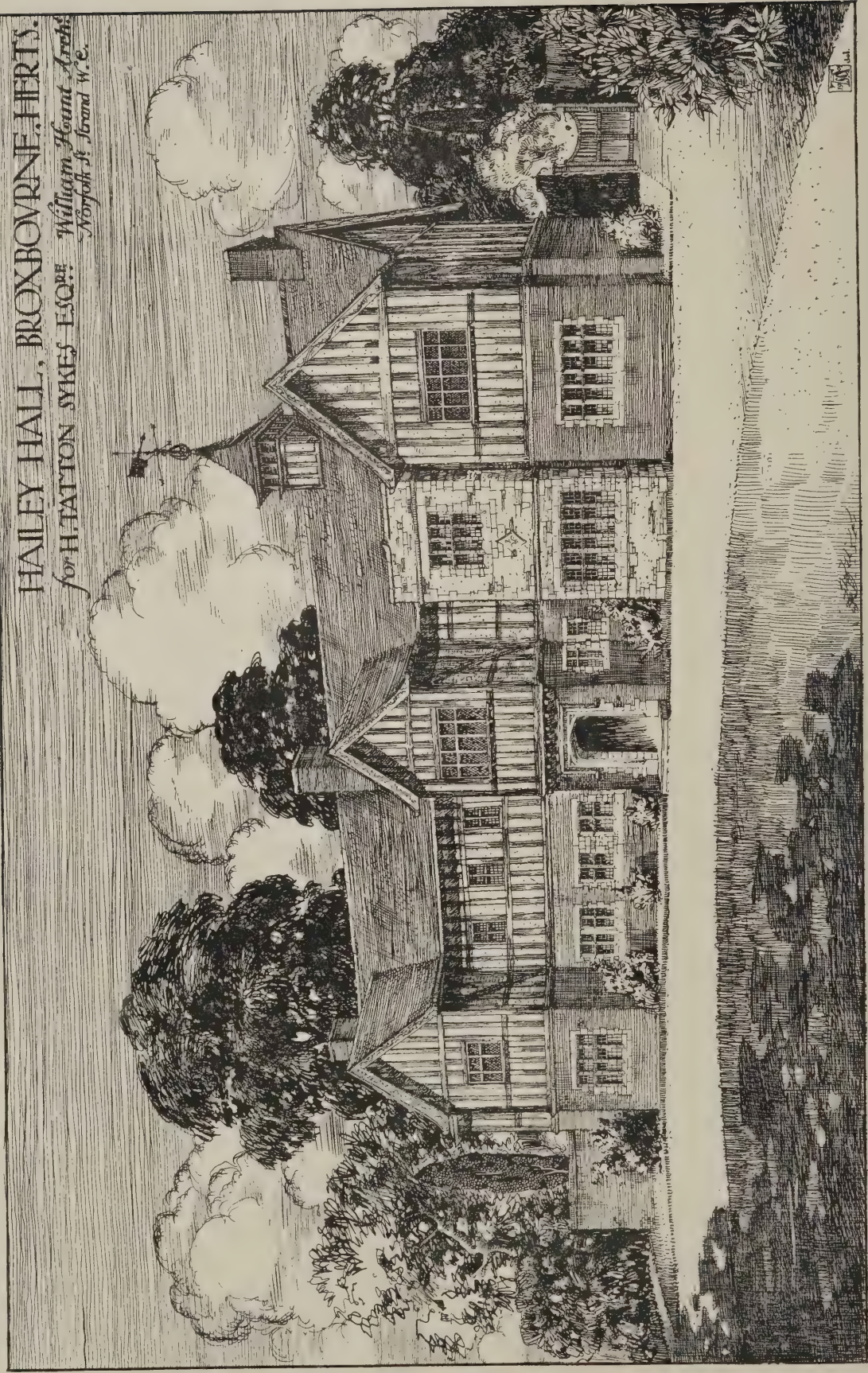
A FERRO-CONCRETE linen factory has been erected for Messrs. Thomas Somerset & Co. in Hardcastle Street, off the Dublin Road, Belfast. The factory is 180ft. long by 50ft. wide. The architect was Mr. W. J. W. Roome, M.R.I.A.I. and he prepared plans on the basis of a light structure five storeys high. Having regard to the delicate nature of the fabrics made, it was essential that the new factory should be as nearly as possible free from dust, and that the ill-effects of machinery vibration should be absent. After careful consideration the Hennebique system of ferro-concrete was adopted for the floors. The erection of the building was entrusted to Messrs. J. & R. Thompson, contractors, of Belfast. Tests were carried out in order to meet the requirements of the city surveyor, Mr. H. A. Cutler. All the floors of one bay were loaded with about 75 tons of granite setts in order to test the pillars, giving a stress of about 2½ cwt. per ft. super., and as a result it was found that there was absolutely no subsidence. A second test dealt with the concrete beams carrying the floors, the area borne by each being loaded with 27 tons. After examination with scientific instruments it was found that the deflection on the 24ft. girder was $\frac{1}{2280}$ th of the span, the guaranteed deflection being $\frac{1}{6000}$ th part of the span. Mr. L. G. Mouchel was the engineer, the work being executed by the Yorkshire Hennebique Contracting Co., Ltd., under the supervision of Mr. David Jones, managing director. The quality of the concrete is of great importance in ferro-concrete structures, and the materials used in this instance were Ballycastle gravel and Portland cement, supplied by Messrs. W. & D. Henderson & Sons, Ltd., of Belfast, the special brand being manufactured by Messrs. J. B. White Brothers, of London.

ABSTRACT OF STOCK, CONSUMPTION, &c., FOR JUNE.

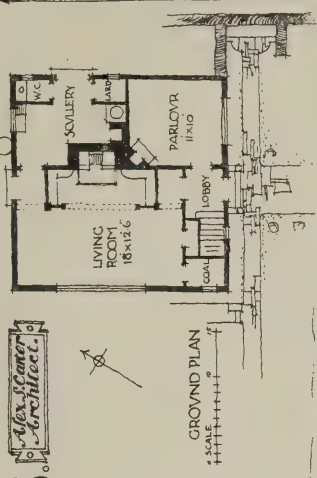
S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock - - -	859,453	1,766,617	895,252	640,057	43,875	4,205,254	2,902,849	5,901,632	20,000
Monthly public dock consumption - - -	175,829	420,952	81,335	100,974	8,083	787,173	290,588	1,185,351	2,770
Overside stock - - -	235,611	564,076	108,989	135,305	—	1,043,981	389,388	308,191	—
Overside consumption (estimated of dock):—									
82 per cent. Sawn	144,180	345,181	66,695	82,799	—	638,855	238,282	651,943	—
55 " Planed									
Duration of supply at same rate of consumption - - -	3'42 months.	3'04 months.	6'78 months.	4'22 months.	5'43 months.	3'68 months.	6'23 months.	3'38 months.	7'22 months.

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PROPOSED COTTAGE AT GREAT-MISENDEN BVCKS.



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FOUNDATIONS.*

By L. L. BUCK, M.Am.S.C.E.

IN studying foundations for heavy concentrated loads the writer has observed the effects of such loads upon existing structures. In such cases, where defects soon appeared, one could easily trace their causes. Where such defects arise from the use of poor stone or mortar they are not worth considering, but there are many cases where such defects appear in which both stone and mortar seem to be excellent. In such it is evident that the question of distribution must be examined.

Sometimes a heavy and heavily-loaded stanchion is found resting on a foot-box made up of plates riveted to the bottom of the stanchion with angles riveted to the lower edges of these plates, and then a horizontal plate having an area of seven or eight times the area of the cross-section of the stanchion, and supposed to distribute the pressure over the area covered by the plate. This is an extreme case, and does not occur as often of late years as it did earlier; but there have been cases within a few years where a heavily-loaded stanchion rested on a casting so shallow that it could not nearly distribute its load over the whole area of the base of the casting.

The writer has in mind one case in which a heavy stanchion rested on a casting, and the casting rested on a large nest of rollers. The outer ends of all the rollers and the outer rollers at each end of the bed were not borne upon at all. It is not easy to distribute enormous concentration of weight over a

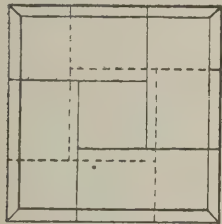


FIG. 1.

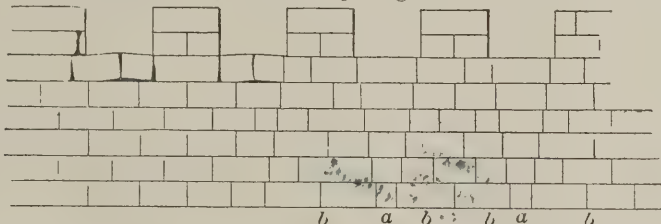


FIG. 2.

sufficiently large area to give the proper unit pressure over the whole area; but this should be done, and it requires greater height in proportion to the base of the bed than is in many cases given.

Having properly proportioned the foot of the stanchion, attention must next be given to the masonry pedestal on which it is to rest. Supposing the bed-plate distributes practically its whole load over its entire area equally, the question will arise as to how far outside of the bed-plate the stone of the pedestal can project (not only advantageously but with safety) in the top course, below the coping, and how far it can go without absolute detriment to the work. If it is extended more than about zins. per ft. of thickness of the course, no perceptible advantage will be gained. Of course, it must project sufficiently to keep the pressure per square foot within proper limits, including the weight of the masonry and the wind-pressure, and if it is to rest on concrete to keep the pressure on the concrete within proper limits.

The difficulty of trying to extend the masonry too far beyond the bed-plate is that the stone may crack, and if so, it will start under the edge of the bed-plate, and the crack may incline still further under the bed-plate at the bottom of the course. Moreover, with too large a mass of masonry there is a tendency to put the best masonry outside and a poorer quality within. In this case the poorest masonry sustains the load. This is similar to making the pedestal of a bag filled with sand. In this case the bag will

be pretty sure to burst, whether made of cloth or masonry.

Fig. 1 represents two courses made of cut stone, with $\frac{1}{2}$ in. joints. This form secures excellent bonds, and from it the writer has obtained excellent results.

Where four or more heavily laden stanchions rest on one foundation the writer thinks it is best to have the centre of pressure on each stanchion so nearly placed that the distance between each pair of stanchions each way shall be about equal to the sum of the distances of the extension of the masonry outside of the stanchions, and then to build the pier in such a manner that there shall be a pedestal of first-class masonry under each stanchion similar to that of the single-stanchion foundation. But the pedestals must be bonded to whatever masonry is outside or between these pedestals.

In some cases, where the load on one stanchion is very great, a casting, in order to distribute its load properly over the whole area of its base, must either be as high as the length of the base or the casting must be in several pieces bolted together for convenience in handling. In this case the bottom length of the stanchion can be given such a taper that its lower end will cover a space equal to half the area of the base of the casting, when the casting will require only about half the height required in the other case. Of course, the casting, in both cases, must be thoroughly ribbed. There are other ways of accomplishing this result, but it is doubtful if on the score of economy they are any better.

In the case of heavy walls having frequent window openings one will sometimes find

them showing disagreeable cracks similar to those indicated in Fig. 2.

This trouble might have been avoided by a form of construction similar to the right-hand portion of the diagram. Construct the area of b so that the area of its base in proportion to that of a shall be equal to that of the weights they respectively sustain.

The whole idea is to use the pedestal form, and not to project the stones under the heavily loaded portions more than the transverse strength of the stone will safely sustain.

OUR PLATE.

HAILEY HALL was built on the site of the old house near Broxbourne by Messrs. Ekins, of Hertford, to the designs of Mr. William Hunt, of Donington House, Norfolk Street, Strand. The brickwork is a dark cherry red; the timberwork is in oak. The roof is covered with deep-red rough tiles. Internally the principal rooms are simply panelled in oak and all other internal woodwork is in oak. There is an artesian well from which a good supply of water is pumped by horse-power.

The cottage at Great Missenden is proposed to be used as a week end or holiday home. The living-room has been made the principal room in the house, with a scullery to be used as a kitchen and also a small parlour or study adjoining four bedrooms provided above. The materials are to be: rough-cast walls, rough brown tiles for roof, oak window frames, iron casements and oak external doors, and the cost is desired not to exceed £450.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Buildings to Measure near Alton, Hampshire.

LONDON, N.W.—SUBSCRIBER writes: "Is there any place round Alton, Hampshire, that would be suitable to measure for the final, R.I.B.A.?"

Alton contains a good church of the Perpendicular period. Four miles south-east of Alton stands Selbourne, with an Early English church. Basingstoke, which is easily reached by rail from Alton, contains a Perpendicular church. The following places are also situated in direct railway communication with Alton:—Winchester; Compton and Soperton, each with a Decorated church; Exton and Hambledon, with Early English churches. H. M.

Buildings to Measure near Barrow.

DOUGLAS, I.M.—PROBATIONERS write: "We intend visiting Barrow, and would be obliged if you would tell us what suitable churches there are in the vicinity to measure for the intermediate R.I.B.A. examination."

There is nothing of architectural interest in the vicinity of Barrow save the remains of Furness Abbey, which will afford material for R.I.B.A. intermediate testimonies. There is work in this abbey of all periods from eleventh to fifteenth century. The entrance to the chapter-house or the abbot's chapel and porch, where the vaulting still remains, are perhaps most suitable for your purpose. Both these portions of the Abbey are in the Decorated style. The plan of the abbey, which is of the Cistercian order, should be noticed, as they can be easily traced out in this fine example. H. M.

City Churches.

LONDON, E.C.—STUDENT, R.I.B.A., writes: "Please name any buildings, and what portions, I could measure either in or near the City for the R.I.B.A. final, testimonies of study, measured Renaissance sheet."

If you prefer Gothic work, some portion of Westminster Abbey would be most suitable for your purpose. It is difficult, however, to obtain permission to measure in the Abbey. Application for sketching tickets should be made to the Dean of Westminster, or to the secretary of the Architectural Association if you are a member of that body. If your application is refused, the next building suitable for your purpose is the Temple Church, a very fine example of the style transitional between the Norman and Early English, on to which is built a fine thirteenth-century nave. St. Ethelreda, Ely Place, Holborn, of a style transitional between the Early English and Decorated; St. Olaves, Hart Street, immortalized by Dickens as St. Grimy Grim on account of the skull and crossbone ornamentation of the railings and gate-posts, and St. Mary's, Aldermanbury, built in 1510, burnt by the great fire and erected to the original design by Sir Christopher Wren, are also churches suitable for measuring as testimonies of study. The whole or portions of the following works will make most suitable testimonies of study of the Renaissance style:—St. Paul's Cathedral; St. Bride's, Fleet Street; St. Mary-le-Bow, Cheap-side; St. Stephen's, Walbrook; St. Michael's, Pater-

* A paper presented to the American Society of Civil Engineers.

noster Row; St. Andrew's, Holborn; St. Martin's, Ludgate; St. Benet's, Paul's Wharf, and many others of Wren's City churches. If a wider choice is required you should consult Godwin and Britton's "London Churches" at the library of the R.I.B.A. The above churches are in the City. Other buildings are St. James's, Piccadilly; St. Clement Danes; St. Mary-le-Strand; St. Martin's-in-the-Fields; St. Paul's, Covent Garden; Kensington Palace; the Dormitories, Westminster School; Greenwich and Chelsea Hospitals; the Banqueting Hall, Whitehall; Ashburnham House, Dean's Yard, Westminster; Somerset House; Horse Guards; House in Adelphi Terrace. If you go on a tour of inspection before deciding what to measure, you will most probably find some building surrounded by a scaffold, undergoing repairs, which you will find of considerable convenience when measuring.

H. M.

Buildings to Measure near Harrogate.

HARROGATE.—E. J. writes: "Kindly name any churches in the neighbourhood of Harrogate suitable for making measured drawings."

There is nothing worth measuring in the immediate neighbourhood of Harrogate. It would be your best plan to make a short stay at Ilkley (where there is an Early English church), at Ripon or at Fountains, when you could take all the necessary measurements on the spot and plot them on your return to Harrogate.

H. M.

Buildings to Measure near Ilfracombe.

MIDDLESEX.—E. T. writes: "Are there any buildings of architectural interest in the neighbourhood of Ilfracombe, in Devonshire, taking a 20-mile radius?"

There are no buildings worth measuring within 20 miles of Ilfracombe. All the fine buildings in Devonshire are to be found in the south and south-west of the county, many of which were mentioned in the "Enquiries Answered" column of last week's issue.

H. M.

Expansion of Concrete Floors.

LONDON.—C. W. writes: "The floors of a building are constructed of steel joists and Portland cement concrete composed of 1 part Portland cement and 5 parts furnace ashes which contain a proportion of iron clinkers and also some small pieces of unburnt coal.

Wherever these floors touch the walls the concrete has pushed out the walls, but in some cases it has been two months before any movement has been visible. I took a sample of the concrete and put it into a bottle, and for about eight weeks it remained and set like a rock and then it burst the bottle all to pieces. At the same time I took a sample of the cement used, mixed it with 3 parts of Leighton Buzzard sand, and put it into a similar bottle, but this sample has had no effect, although, like the other, it has set extremely hard. In one case where the concrete floor had pushed out the brickwork of the building the brick wall was pulled down and rebuilt, but the concrete floor, which was not disturbed, has again pushed it out. What is the explanation?"

The cement was over-limed. If you will refer to the article on ferro-concrete in last week's issue you will also see that concrete will contract if allowed to set in air, and will expand if kept wet. The usual practice in constructing concrete floors is to leave a space round the walls until all expansion has stopped.

Books on Masonry.

ST. ANNES-ON-SEA.—F. S. writes: "Which is the best book on stonecutting and masonry? I have Purchase's and Dobson's."

There are "Stereotomy," by G. E. Warren, and "Stonecutting and Masonry," by Siebert, both on our book list, but W. R. Purchase's is generally preferred to both of these.

Renaissance Buildings within 100 Miles of Sunderland.

SUNDERLAND.—T. H. R. writes: "Please name any suitable places within 100 miles of Sunderland where I could go during a fortnight's holiday in order to study Renaissance architecture. I know Seaton Delaval, Castle Howard and Duncombe Hall (near Helmsley), but would like some more delicate examples than Vanbrugh."

The following is a list of the best-known Renaissance buildings in the northern counties:—Levens and Lizerg Halls, Westmoreland; Chipchase Castle, Northumberland; Clegg Hall, Astley Hall, Speke Hall (a very fine specimen of half-timber work), Kenyon Peel Gatehouse, Hoghton Tower, Lancashire; Wentworth Hall, Mount Grace Priory, Ingleby Manor, Burton Agnes, Yorkshire. More definite information might be obtained by applying to the secretary of either the

Northern Architectural Association or the York Architectural Society. H. M.

Indentures not Stamped.

HALIFAX.—FOREMAN writes: "Would an apprentice's agreement papers which are witnessed but not stamped be binding and sufficient to keep this apprentice until he was twenty-one years of age?"

Yes, but an employer would have to pay a heavy fine for defrauding the revenue, for the indentures would be admitted as evidence in a court of law. The prospect of paying the fine might prevent an employer insisting on his rights.

IN PARLIAMENT.

(By Our Press Gallery Representative.)

LORD BALCARRES has informed Mr. Whitmore that the First Commissioner of Works is unable to give any undertaking with regard to the suggestion that the enclosure around Canning's statue in Parliament Square should be opened to the public and laid out so as to correspond in appearance and utility with the garden which adjoins it on the south.

Lighting of Parliament Square.

Replying to a question in reference to the lighting of Parliament Square, Lord Balcarras said it was proposed to adopt the type of lamp which had proved so successful in New Palace Yard, and it was expected that the work would be carried out in the autumn so that the lamps might be available before the winter.

Salisbury Memorial in Westminster Abbey.

In the House of Lords on July 7th, Earl Spencer asked the First Commissioner of Works whether he could state what steps had been taken to secure the contemplated memorial in Westminster Abbey to the late Marquis of Salisbury. Without wishing to impede the placing of a memorial to Lord Salisbury in Westminster Abbey, he would like to be assured that the naval memorial to Captain James Cornwall was not going to be done away with or mutilated.

Lord Windsor in reply said that Parliament was concerned to a certain extent with monuments erected by moneys voted by Parliament, but the question of erecting monuments in Westminster Abbey, and their position, rested with the Dean. The question was now a specially difficult one; the Abbey was very full of monuments and it was thought by many persons that there could hardly be left room for more than a few. It was proposed that the monument to the late Lord Salisbury in the Abbey should take the form of a recumbent figure resting on a tomb; the Dean approved of it and offered a site on the north portion of the Consistory Court. This site involved an alteration in the position and the curtailment of the monument which was erected in 1753 to the memory of Captain James Cornwall. It was proposed to place it close up to the west window of the Consistory Court. It was not now in its original position. So serious had been the disfigurement of the architecture of the Abbey, and so great the inconvenience, that considerable portions of this monument to Captain James Cornwall had been cut away in order to reduce its height and give access to the Consistory Court by two small passages, one on either side. He believed himself that the present proposal was a very good one. It would improve the Consistory Court while safeguarding the memory of Captain Cornwall. The work in connection with the Salisbury memorial would be done by Mr. Bodley and Mr. Goscombe John.



"CHIPPENHAM"; CROWTHORNE; BERKS.
BUILT FOR MISS P. AWDRY.

This house was erected in 1903. The walls are of brick, whitened; the paint dark green. It is roofed with sand-faced tiles supplied by Messrs. Collier, of Reading. The house contains six bedrooms, a bathroom, linen cupboard and w.c. on the first floor. A feature is made of the entrance hall with two arches having plaster enrichment against the stairs; also of the verandah connecting the dining-room with the cycle-house. The arrangement of windows on the ground floor has been effectual in screening the drawing-room and dining-room from the view of the next house, which stands to the left of the above view. Mr. Arthur C. Martin, of 75, Newman Street, London, W., was the architect; Mr. J. B. Seward, of Wokingham, was the builder, and the contract price was £967.

Views and Reviews.

Magnetism and Electricity.

This is an excellent student's text-book based upon a previous work by the same author, but brought up to date and with the addition of a considerable quantity of new matter rendered necessary by the progress made in electrical theory during the last few years. The treatment throughout is of an elementary character, the explanations and examples being extremely lucid. The book, which is in three parts and deals with electrostatics, magnetism and current electricity, also contains numerous illustrations which materially add to its value as an educational factor.

"Higher Text-book of Magnetism and Electricity," by R. Wallace Stewart. Price 6s. 6d. University Tutorial Press, Ltd., 157, Drury Lane, W.C.

Alternating Currents.

This is another work of a theoretical character. It is to be completed in two volumes. The first book illustrates the more general mathematical theorems which elec-

tricians use in their everyday work, while the second will treat of the theory of alternators, motors, transformers, converters, and of the transmission of power by polyphase currents. There are a number of references at the end of nearly every chapter which should prove helpful to the student, while the work may generally be recommended to the electrical engineer.

"A Treatise on the Theory of Alternating Currents," Vol. I., by Alexander Russell, M.A., M.I.E.E. Price 12s. nett. London: C. J. Clay & Sons, Cambridge University Press, Ave Maria Lane; and H. K. Lewis, 135, Gower Street, W.C.

Chemistry.

The science of chemistry has advanced so much of recent years that the want of a text-book for elementary students giving instruction from the latest standpoint was greatly felt, and until this book, now in its second edition, appeared in 1900 the need was not supplied. It is fortunate that so eminent an authority in the new chemistry as Professor Wilhelm Ostwald, one of the foremost chemists in the world, should have found time and opportunity to write such an ele-

mentary book of instruction. Although the usual historical arrangement according to the elements of compounds is adhered to, all the latest theories, such as the conception of ions, solutions, &c., take their proper place. The book is most clearly written and well illustrated, and covers a vast ground in a way that will be intelligible to all students who have some general education. Previous books have far too often been written in a style that was only suitable to children. Students of chemistry deserve to be placed on the same plane as students of other sciences; and if books on mathematics and physics can be understood when written in a purely theoretical manner, there is no reason why this book should not be clear to every student of intelligence.

"The Principles of Inorganic Chemistry," by Professor Ostwald. Price 18s. nett. London: Macmillan & Co., Ltd., St. Martin's Street, Leicester Square, W.C.

Law Cases.

An Architect's Claim.—Mr. Philip C. Davies, architect, of Rosendale Road, Herne Hill, sued Mr. Arthur Tollington Angill, of Drayton Gardens, South Kensington, at the Brompton County Court recently for £48 in respect of an alleged breach of contract. A small counter-claim for £2 was admitted. According to plaintiff's story he met the defendant, who was desirous of obtaining £43,000 for the erection of a block of flats, at Drayton Gardens in December, 1903. Mr. Angill led him to understand that he had the major interest in the ground on which he intended to erect the flats, and plaintiff entered into an agreement to prepare the necessary plans and to get the money advanced. Mr. Davies was in train of getting the money when he heard that the property had been put up to auction by a firm of bankers who had had a mortgage on the ground. So the scheme fell through, and plaintiff's trouble was all in vain. Defendant contended that the arrangement with the plaintiff was that the commission was only to be paid if the £43,000 was found. The necessary plans for the proposed flats had been prepared by an eminent architect before the plaintiff entered into the speculation. The judge found for the plaintiff, awarding him 33 guineas and costs.

A Bonus Arrangement.—At the Marylebone Police Court, London, recently, A. Marriott, described as a builder and decorator, of Belle Vue Road, New Southgate, was summoned before Mr. Paul Taylor by Walter Peakall, a young man living at 5, Eastbourne Road, East Ham, for £5 10s. wages due. According to the complainant, in May last he had been out of employment for five months, so he advertised for employment, offering a bonus of £3 if he could be guaranteed regular work. The defendant answered the advertisement and agreed to employ him regularly at 6d. an hour, and the complainant thereupon paid him 30s. on account of the £3 bonus, the balance to be paid at the end of a month. He worked for the defendant 103 hours, and although he made many efforts to get his money, all he had received was 9s. 6d. In making an order against the defendant for £2 2s., with 30s. costs, the magistrate advised the complainant never again to give a bonus for employment.

A Block of Shops at Monifieth, Scotland, has been erected in the High Street from designs by Mr. James Munro, of Monifieth. The various contractors were Mr. Charles Dick, mason; Mr. J. B. Hay, joiner; Mr. T. Dewar, plumber; Mr. William Ross, glazier, all of Monifieth; Messrs. Brand & Son, slaters, Arbroath; Mr. Alex. M'Ritchie, plasterer, Carnoustie; Messrs. T. Melvin & Sons, oven-builders, Glasgow.



SAINT PAUL'S CHURCH, BUSHEY, MERTS.: AUSTIN DURST, M.A., ARCHT.



This building was opened in October, 1904, and is a district church of the old parish. It is not intended to be used permanently as a church, and was designed to be used for secular purposes during the week by cutting off the chancel by means of sliding doors and raising on a platform three rows of chairs at the west end for use at concerts or lectures. The contract, carried out by Messrs. G. & J. Waterman, of Watford, was about £1,200.

PAINTS AND PAINT-WORK.—IV.

(Continued from p. 302, No. 538.)

VEHICLES.—I.

THOUGH the pigments used in paints are very numerous, the vehicles used are comparatively few. Their function is to carry and fix the pigment. They consist of liquids, simple or mixtures, including solids in solution that may be used as the fixing agents. We shall deal with these before the pigments, which latter will be considered in their relation to the vehicles. The principal vehicles are oils, and we will first refer to them.

Oils.

There are two kinds of oils, namely, (1) fixed or fatty oils and (2) essential or volatile oils.

The characteristic property of the former is that they produce a permanent translucent stain upon paper, whereas the latter produce a stain that disappears upon exposure to the air. Fixed oils derive their name from the fact that they cannot be distilled or boiled without change, whereas the volatile oils can be distilled. Essential oils are almost all of vegetable origin. Turpentine may be instanced as an example of an essential oil. The fixed oils are chemically analogous bodies to the fatty oils, fats and waxes. They are practically insoluble in water, but dissolve to some extent in absolute alcohol or strong spirit (especially when hot), and are easily soluble in ether, chloroform, carbon disulphide, benzene, petroleum spirit, turpentine and other volatile oils. Fixed oils and fats are also readily miscible with each other. They are called by chemists glycerides, for they are compounds of glycerine and fatty acids, and, in view of the presence of the latter, are salts, *i.e.*, a combination of an acid radicle and a basic radicle. Glycerine $[C_3H_5(OH)_3]$ is a triatomic alcohol; that is, one, two or three of the molecules of the hydroxyl (OH) that it contains may be replaced respectively by one, two or three acid molecules. Alcohols, it may be explained, are bodies constructed on the model of water, one of the hydrogen atoms in the molecule of water being replaced by a compound radicle. Thus water may be stated as $H(OH)$, and methyl alcohol or wood spirit as $CH_3(OH)$.

The term "ester" is used to distinguish the salts of alcohol radicles, and the glycerides are esters of the glyceryl radicle C_3H_5 , having a constitution expressed by the following formula, $(C_3H_5).y.O_2$, in which y represents the radicle of one of the fatty acids and may have the general formula $C_nH_{2n-1}O$ as the radicle of the stearic series of fatty acids; $C_nH_{2n-3}O$ as the radicle of the oleic series of fatty acids; $C_nH_{2n-5}O$ as the radicle of the linoleic series of fatty acids; $C_nH_{2n-7}O$ as the radicle of the linolenic series of fatty acids; or $C_nH_{2n-9}O_2$ as the radicle of the ricinoleic series of fatty acids. The glycerides or glyceryl esters of linoleic or linolenic acids are the chief constituents of linseed and other drying oils.

Soaps are formed by substituting an inorganic radicle for the glyceryl radicle in glycerides. The alkaline soaps, namely, those of potash, soda and ammonia are soluble in water; but those of lime, lead, copper and similar metals are insoluble in water.

The fixed oils may be divided into two groups: (1) non-drying and (2) drying. The former are by far the larger group of the two, but only the latter are used by painters. These drying oils thicken by the absorption of oxygen from the air, and only those which absorb a considerable quantity are valuable, and the list of these is short. The painter is really concerned with linseed, poppy seed, hemp seed, niger seed and rosin oils. Linseed oil is far and away the most important of

these, and poppy seed and hemp seed oil are used only by artists, with occasionally grape seed and castor oils. Rosin, niger seed, cotton seed and menhaden (a fish) oils are occasionally used as adulterants to linseed oil. The other oils used by artists are preferred to linseed oil, because they have a paler colour and do not affect the tints of the pigments as linseed oil does, but as they are more expensive only the latter is used for ordinary paintwork.

Linseed Oil.

Linseed oil is obtained from the seed of the flax, a plant—*linum usitatissimum*—which is cultivated in America, England, Holland, India, Ireland, Germany and Russia for both its seed and its fibre, the latter being woven into linen. The plant grows best in a cold and temperate climate, and for this reason the East India species, exported from Calcutta, is inferior in quality. The two chief qualities of linseed recognized in the trade are the Baltic, which grows in the north of Russia and comes from Riga and other ports on the Baltic coast of that country, and the Black Sea, which is grown in the south of Russia and is exported from Libau, Odessa and other ports on the Black Sea. The Baltic seed is the best. Seed grown in other countries is used locally, but little finds its way into the English market. The linseed found in the trade is not pure, but is mixed with hemp and rape seed.

How the Oil is obtained.

Two processes are adopted for obtaining the oil from linseed, known as the English and the Anglo-American. In the first-named system the seed is sifted and crushed, ground in a mill of the edge-runner type, then heated for about twenty minutes to a temperature of 150 degs. to 160 degs. Fahr. (thus liquifying the oil and so causing it to flow more freely from the seed while being pressed and coagulating the albuminous and mucilaginous matters contained in the seed, thus preventing them being pressed out with the oil); then placed in bags holding about 18 lbs. of seed and subjected to a pressure of about 750 lbs. to the square inch in a hydraulic press for about twenty minutes, followed by a pressure of about 4,500 lbs. for seven minutes, and finally refining the oil. In the Anglo-American process the seed is first crushed, then heated as in the English process, then moulded into cakes about 1½ ins. thick, weighing about 18 lbs.; fourthly, subjecting these cakes to a hydraulic pressure of about 2,000 lbs. to the square inch for about twenty-five minutes and afterwards to a pressure of 4,500 lbs. for seven minutes, and finally refining. The last in both systems is the same.

Refining the Oil.

The linseed oil as it comes from the press contains the glycerides of the characteristic fatty acids, water, mucilage, a minute quantity of essential oil and vegetable colouring matters. Only the glycerides are of value, and the refining process has as its object the removal of the other constituents, except the colouring matters present which do not injuriously affect the drying properties of the oil, and therefore need not have attention directed to their removal.

The process of refining consists in heating the oil in large tanks to about 160 degs. to 170 degs. Fahr. This makes the oil more fluid and coagulates any albumen which may have passed out of the seed. After the solid impurities have settled the oil is fairly bright, and is occasionally sold in this condition, but it is generally further treated by mixing with it a 6 per cent. solution made of equal parts of water and sulphuric acid. After standing for about twenty-four hours, the acid solution will have settled to the bottom, leaving the oil at the top, and the acid is run off and the oil washed from any remaining traces by means of warm water. The action of the sulphuric acid is to char

and dissolve any albuminous or mucilaginous matters, which bodies are objectionable because they are liable to decomposition and would render the oil rancid. The oil is now in the condition as usually sold under the name of "raw linseed oil."

Properties of Linseed Oil.

The specific gravity of linseed oil ranges from '932 to '937, averaging '935. Baltic oil is usually the heaviest. Linseed oil is soluble in about forty times its bulk of alcohol at ordinary temperatures and five times its volume at boiling point. It readily dissolves in ether, petroleum spirit, shale naphtha, turpentine, chloroform and similar solvents.

Drying Power.

Linseed oil has a much greater power of absorbing oxygen than other oils, and its superiority for paintwork is due to its property of drying on exposure to air.

The following absorption of oxygen per gramme was obtained by experiments:—

Oils.	Cub. centimetres of oxygen absorbed.
Baltic linseed	191
Black Sea	186
American	156
East Indian (Bombay)	130
Ditto (Calcutta)	126
Brown rape	20
Cotton seed	24.6
Colza	17.6
Olive	8.2

The quality of linseed oil depends upon its absorptive power for oxygen, and in this respect Baltic oil ranks superior to Black Sea oil, and this latter to East Indian.

The time taken to dry a thin film of raw linseed oil such as would be produced in painting is about two days. The composition of linoleic acid, one of its chief constituents, is $HC_{18}H_{31}O_2$; and that of linolenic acid, another of its constituents, $HC_{18}H_{29}O_2$.

Upon oxydization the oil forms a body known as oxylinoleic acid, which becomes further oxydized to linoxyn, the composition of which is $C_{32}H_{51}O_{11}$.

This body is quite insoluble in water, alcohol or ether, though it is slightly soluble in chloroform.

Boiled Linseed Oil.

The property of absorbing oxygen valuable to the painter is increased by heating linseed oil to a temperature of 400 degs. to 500 degs. Fahr. for a few hours, and still further increased by adding to the oil while it is being heated certain bodies known as "dryers" (about 5 lbs. to every ton of oil). Oil thus treated is known as "boiled oil."

The boiling is done by the direct heat from the fire or by steam, the usual time taken being about four hours, and it is allowed about eight hours to cool and settle. The steam process of boiling produces an oil of paler colour than the direct heat. The clear oil is only sold as "boiled oil," the turgid oil at the bottom, known as "foots," being used for making putty and by some discredited makers for cheap tins of ready-mixed paints. During the boiling process water is continually given off, together with a large quantity of acrolein (C_3H_4O), a derivative of glycerine, acetic acid ($HC_2H_3O_2$), formic acid ($HCHO_2$), and other acids of the steric series. If the temperature is kept below 400 degs. Fahr. a comparatively pale coloured oil is obtained, but if allowed to go over 500 degs. Fahr. then a dark-coloured oil is produced. Of course, the pale-coloured oil is preferred, though to produce this the boiling has to be continued a longer time. The nature of the "dryers" has some influence on the colour. Manganese gives a darker colour than any other "dryer"; then comes red lead and litharge, while acetate of lead and manganese, and the oxylate of manganese produce the palest oils. The action of the boiling is to produce linoxyn and a combination of linoleic acid with the base of the "dryers," which dissolves and forms a kind of varnish, to which the gloss of boiled oil is due. The action of the "dryers"

is not to yield up oxygen to the oil, but to facilitate the absorption of the oxygen of the air.

"Boiled Oil" produced without Boiling.

Messrs. Hartley & Blenkinsop have patented a process for producing quick-drying oil which has the advantage of making it exceedingly pale in colour so that it can be used for mixing with white pigments with little effect upon the purity of the colour nor darkening or dulling the brilliancy of pale and bright-coloured pigments such as chrome yellow, emerald green, &c.; further, it does not become discoloured on exposure to sulphur-laden air, as boiled oil made with lead "dryers" does. This process consists of treating the oil with dilute sulphuric acid sufficiently strong to remove water and char and dissolve mucilage and to remove some of the colouring matter, while not strong enough to act upon the oil. A manganese linoleate, made by preparing a soap of linseed oil and adding thereto a solution of a manganese salt, is dissolved in turpentine and a small quantity of the solution added to the linseed oil. The solution is raised to the temperature of boiling water and a current of air passed through until it has obtained the desired thickness.

Several other processes have been patented for manufacturing boiled linseed oil.

Properties of Boiled Oil.

The average specific gravity of boiled oil is about .945. The property which the oil has of giving a hard lustrous coat upon exposure to air is valuable, but it is too hard and liable to crack for it to be used alone, and raw linseed oil is always added to endure a more elastic coat.

Adulterants and Substitutes.

Linseed oil is often adulterated, principally with mineral and rosin oils, and occasionally with cotton seed, niger seed and whale oils, and there have been many substitutes proposed, but while the price of linseed oil is low there is no particular advantage to be derived from their use. Even for the cheapest work architects will be well advised to rigidly specify linseed oil and give no loophole for the use of any substitute.

(To be continued.)

Builders' Notes.

Messrs. Mitchell Brothers, of Shalford, have just begun the erection of a new police-station at Tartar Hill, Cobham.

The Works and Stores Committee of the Metropolitan Water Board have recommended for acceptance the tender of Mr. J. Bentley, of Bradford, of £25,442 17s. 8d. for the construction of reservoirs at Cricklewood.

The Atlas Stone Co., Ltd., Cambridge, artificial stone and paving flag makers, have declared a dividend of 5 per cent. on the ordinary shares for the year ending 30th April last, a dividend of 6 per cent. on the preference shares having already been paid.

The Dublin Building Trade dispute has terminated. Under what is known as "rule 7a," the master-builders are to obtain all the advantages conceded by the Union to builders not members of the Association, and where the work is done "by measurement or agreement for such persons" the master-builders are empowered to claim a similar advantage. Further, every employer is to be at liberty to employ tradesmen from "any recognized society of brick and stonemasons in the United Kingdom" upon the understanding that all such tradesmen, should they elect to continue to work in Dublin, are "bound within twelve months from commencing such employment" to join the Dublin Brick and Stonemasons' Union.

London County Council.—At the meeting of the London County Council on July 4th it was decided to erect a new fire-

station at Fulham. The seal of the Council was ordered to be affixed to the agreement with Mr. A. Drury, A.R.A., which provides for the payment of the sum of £1,200 to Mr. Drury for the modelling and casting of each of the eight panels for Vauxhall Bridge, including everything necessary to render the panels fit and ready for fixing. Mr. Drury undertook to indemnify the Council from all claims that might be made by any other persons associated with him in the design and execution of the work. All models and completed castings would be the property of the Council, and Mr. Drury was precluded from reproducing the panels or any part of the designs in any form or shape. In the event of the work not proceeding beyond the stage of sketch models being made, Mr. Drury was to be paid a sum of £100 for each of those made by him. The Education Committee reported that the Plumbers' Company had offered to the Council as a free gift the fittings and appliances belonging to them at King's College, and had also suggested that the Council should offer scholarships to teachers of plumbing, or skilled plumbers who desired to become teachers, to enable them to take a course of instruction in the subject. From enquiries which the committee had made however, they had ascertained that there was not at present any dearth of teachers of plumbing, and in those circumstances they were of opinion that no advantage would accrue by taking over the control of the plumbing school. They were not prepared, therefore, to recommend the Council to accept the offer of the Plumbers' Company of the fittings and appliances at King's College, or to establish scholarships in plumbing, and had so informed the Plumbers' Company.

MODERN FURNITURE AND DECORATION.

THE eighth annual meeting of Messrs. Waring & Gillow, Ltd., was held in London last Friday. Mr. S. J. Waring, junior, who presided, said that the company's business for 1904 showed a profit of £131,551 before providing for income tax, directors' fees and interest, enabling them to pay 7 per cent. dividend on the ordinary shares, to put £15,000 to reserve (which would then amount to £115,000), and to carry forward a balance of £13,585 to the current year.

The year under review was by no means a generally active one for British trade, and the fact that the company did so well might be taken as an indication that they had built on sure foundations. The growth of the annual profits had been continuous. In 1900 the amount, before the deduction of the charges referred to, was £77,155; in 1901, £86,201; in 1902, £101,927; in 1903, £119,983; and in 1904, £131,551—the last two items including the dividends received in connection with the company's holding of ordinary shares in Hampton & Sons, Ltd.

Last Year's Successes.

Last year they were engaged in a number of important contracts, many of which—especially the Sultan of Turkey's yacht, the Waldorf and Lyceum Theatres, and work at the new Savoy Hotel—had won the most favourable opinions of the press. With their exhibit at the St. Louis World's Fair they carried off two Grand Prizes for furniture and decoration, besides gold medals for sanitation, upholstery, &c.; and they had good grounds for hoping, from the work already placed in their hands that the impression made would bear fruit in the United States, now that the States had realized the artistic possibilities of refinement and simplicity in the decorative treatment of their homes.

The Waring-White Building Co.

The year 1904 was further signalized by the formation of the Waring-White Building Co., the object of which was to combine the latest inventions and most useful features of American construction with the soundness and stability associated with British methods. Mr. Waring said he had ventured to predict last year that this combination would mark a new epoch in the building trade. It had already fulfilled its promise. Within nine months from the starting of the foundations in Cockspur Street, the American Shipping Combine were in possession of their new offices; the Ritz Hotel in Piccadilly was being built with a vigorous spirit rarely, if ever, witnessed in England before; and the company had the Liverpool Cotton Exchange and other important buildings in hand, which would be carried out with the same thoroughness and energy. The company worked upon a scientific basis; it was prepared to build on a commission based upon cost, or in competition, guaranteeing to erect its buildings within fixed limits of cost and within fixed dates for completion. It was unnecessary to emphasize the advantages to capitalists where the rapid erection of a building frequently meant an economy in interest during construction of many thousands of pounds. Thoroughness, scientific construction and promptitude were the salient points of the Waring-White Co.'s programme.

Waring & Gillow's New London Premises.

The inadequacy and scattered positions of their present London shop space had hitherto to some extent handicapped their efforts, but these disadvantages were being met by the handsome new building which was being erected for the company in Oxford Street, and which was rapidly approaching completion. It was perhaps superfluous to say anything about a structure which, so far as its exterior went, spoke eloquently for itself, but it would be difficult to name a building directly associated with commerce that had attracted so large an amount of artistic interest and been so universally admired.

In these new premises they hoped to assist public taste in the choice of beautiful domestic surroundings, and to bring within the reach of all classes the possibility of artistic excellence in English homes. Moreover, the householder would find there not only everything he wanted but everything at competitive prices; while at the same time no effort would be spared to maintain the high repute of the firm for those qualities of taste, harmony and proportion which it had consistently and with some success endeavoured to illustrate.

The directors cherished the conviction that the opening of the new premises would be an important landmark in the history of the firm, and it was more than probable that this would result in the early future in the deferred shares becoming a good profit-earning security; but as at present these were almost wholly held by the Waring family and by a trust for the benefit of the employees of the firm, it was the intention of the present Board not to recommend any deferred dividend until the reserve fund reached a quarter of a million.

This expansion would naturally necessitate an issue of further capital, which would be offered for subscription forthwith.*

Mr. Waring then proceeded to speak of the current year's business (which includes a new palace for the Maharajah of Kapurthala), and concluded by emphasizing the need for commercial efficiency and the necessity for better technical and secondary education in order to compete with America and Germany—two rivals of the keenest mettle.

* Particulars are given on pp. xx and xxi of this issue.

Complete List of Contracts Open.

DATE OF DELIVERY	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
July 13	Redruth—Lecture Hall, &c.	—	Sampson Hill, Green Lane, Redruth.
" 13	Omagh, Ireland—Gallery	—	Omagh District Asylum.
" 13	Wandsworth, S.W.—Church	—	H. L. Butler, Salesian Schools, Surrey Lane, Battersea, S.W.
" 13	South Mimms—Improvement in High Road	Rural District Council	W. H. Mansbridge, 40 High Street, Barnet.
" 13	Fishburn—Classroom	—	J. G. Wilkinson, Fishburn.
" 14	St. Ives—Alterations to Workhouse	Guardians	Workhouse, near St. Ives.
" 14	London, S.E.—Boundary Walls, &c.	London County Council	Superintending Architect's Department, 15 Pall Mall East, S.W.
" 14	Dundee—Additions to School	School Board	J. H. Langlands, 31 Murray Gate, Dundee.
" 14	Farnham and Woking—Alterations to Schools	Education Committee	Jarvis & Richards, 36 Victoria Street, S.W.
" 15	Evesham—Walls, &c.	Burial Board	G. New, 11 Bridge Street, Evesham.
" 15	Netherton—Alterations at Church	Building Committee	Churchwardens, All Souls', Netherton.
" 15	South Brent, Devon—Alteration to School	Education Committee	S. Brent, Council School.
" 15	Isleworth—Sundry Repairs	Burial Board	E. J. Partridge, Bank Chambers, 39 George Street, Richmond.
" 15	Birmingham—Tramway Depot	—	A. Rowe, King's Court, Colmore Row, Birmingham.
" 16	Gainsborough—School	Education Committee	Scorer & Gamble, Bank Street Chambers, Lincoln.
" 17	S. Shields—Slaughter-houses	Town Council	S. E. Burgess, Chapter Row, South Shields.
" 17	Crosskeys, Mon.—Partial Rebuilding of School	Education Committee	R. L. Roberts, Abercarn, Mon.
" 17	Dromin, Ireland—Two Cottages	Directors	W. H. Mills, Amiens Street Terminus, Dublin.
" 17	Jarrow—Alterations to Schools	Education Committee	T. H. Spencer, Education Office, Town Hall, Jarrow.
" 17	King's Norton—Library	Urban District Council	A. W. Cross, 23 Valentine Road, King's Heath, Birmingham.
" 17	Merthyr—Altering Hall	—	C. M. Davies, 112 High Street, Merthyr.
" 17	Higher Broughton—Four Shops	—	E. Woodhouse, 88 Mosley Street, Manchester.
" 17	Portsmouth—Pulling-down Villa and Erecting caretaker's House on Site	Education Committee	A. H. Bone, Cambridge Junction, Portsmouth.
" 17	London, S.W.—Alterations to Basement of Library	Public Libraries and Museums Committee	Public Library, Manresa Road, Chelsea, S.W.
" 18	Glanawmor—Villa	—	J. Jones, Dolwen, Rhydlewis.
" 18	Ashford—Sorting Office	Commissioners	Post Office, Ashford.
" 18	London, W.—Thirteen Houses at Uxbridge	Great Western Railway Company	Engineer, Paddington Station.
" 19	Beckenham—Extensions to School	Urban District Council	J. A. Angell, Architect to Education Committee, Beckenham.
" 19	Leigh-on-Sea—Iron Building	Education Committee	J. H. Nicholas, County Offices, Chelmsford.
" 19	London, N.E.—Alterations, &c., to Boardroom	Guardians	J. W. Dunford, 100c Queen Victoria Street, E.C.
" 20	Heywood—School	Education Authority	J. E. Mills, Market Place, Heywood.
" 21	Nantymoel—Additions to Institute, &c.	Committee	J. M. Williams, Architect, Blackmill.
" 21	Weardale—Organ-chamber	—	W. Brown, St. John's Chapel, R.S.O., co. Durham.
" 22	Penge, S.E.—Depôt Buildings	Urban District Council	H. W. Longdin, Town Hall, Anerley, S.E.
" 22	Winsford—Bakery	Industrial Co-op. Society	Company's Office, 21 High Street, Winsford.
" 24	Wrexham—Infirmary	Guardians	G. Morrison, King Street, Wrexham.
" 24	Tottenham—Summer Repairs to Schools	Education Committee	W. H. Prescott, 712 High Road, Tottenham.
" 25	London, S.W.—Block of Dwellings	London County Council	Housing Section of Architect's Department, 19 Charing Cross Rd., W.C.
" 25	West Ham—Tramway Office, &c.	County Borough	J. G. Morley, Town Hall, West Ham.
" 29	Widnes—Premises	Industrial Co-op. Society	Society's Offices, 406 Church Street, Runcorn.
" 31	Stoney, E.—Extension of Library	Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
Aug. 1	Buckingham—New Royal Latin School	Governors	Town Hall, Buckingham.
" 1	Carlisle—School Buildings	Education Committee	A. H. Collingwood, 15 Fisher Street, Carlisle.
" 5	Sheffield—School	Education Committee	Secretary, Education Committee, Education Offices, Sheffield.
No date	Chesterfield—Church and Schools	—	W. C. Jackson, 29 Knivesmith Gate, Chesterfield.
ENGINEERING:			
July 13	Rotherham—Griststone Culvert	Rural District Council	R. Bradbury, 29A High Street, Rotherham.
" 13	Birkenhead—Roofing Reservoir	Gas and Waer Committee	J. W. M. Richardson, Water Engr.'s Office, 52 Balls Rd., Birkenhead.
" 14	Earby, Skipton, Yorks—Sewage Tanks	Rural District Council	H. A. Johnson, 15 Exchange, Bradford.
" 14	Lerwick—Water Pipes	Town Council	G. Cruickshank, Borough Surveyor, Lerwick.
" 15	Belfast—Heating, &c., Institute	Library and Technical Instruction Committee	S. Stevenson, 83 Royal Avenue, Belfast.
" 17	Leicester—Laying Mains	Water Committee	J. B. Everard, 6 Millstone Lane, Leicester.
" 17	West Ham—Electric Lighting, &c.	Education Committee	W. Jacques, 2 Fen Court, Fenchurch Street, E.C.
" 17	Maidstone—Repairing Bridge	Rural District Council	M. C. Warne, Surveyor, Barming, near Maidstone.
" 17	Neath—Mains	Rural District Council	Council Offices, Orchard Street, Neath.
" 17	Dartford—Extension of Electricity Works	Urban District Council	T. E. Tiffin, Council Offices, Dartford.
" 18	Loughborough—Cables, &c.	Gas and Electricity Committee	W. H. Allen, Electricity Works, Bridge Street, Loughborough.
" 18	Stourbridge—Wiring	Guardians	G. F. James, 12 Hagley Road, Stourbridge.
" 18	Londonderry—Engines	County Council	County Surveyor, County Court House, Londonderry.
" 19	Lisbon, Portugal—Iron Bridge	—	1, a Reparticao da Direcção Geral de Obras Publicas Minas.
" 19	Burton-on Trent—Jointing, &c.	Rural District Council	Willcox & Raikes, 53 Temple Row, Birmingham.
" 21	West Hartlepool—Outlet Extension	Corporation	N. F. Dennis, Municipal Buildings, West Hartlepool.
" 22	Scalloway, Shetland—Water-supply	—	Jenkins & Marr, 16 Bridge Street, Aberdeen.
" 24	Antwerp—Heating Apparatus	Commercial Intelligence Branch of Board of Trade	Hotel de Ville, Antwerp.
" 25	Dublin—Locomotives	Cleaning Committee	S. Harty, City Hall, Dublin.
" 26	West Hartlepool—Iron Covering	Corporation	N. F. Dennis, Municipal Buildings, West Hartlepool.
" 28	Hull—Supply and Fixing of Constructional Steelwork	Corporation	City Architect, Town Hall, Hull.
" 29	Lydbrook—Culvert	Education Committee	M. H. Medland, 15 Clarence Street, Gloucester.
Sept. 1	Merthyr Tydfil—Destructor Plant	Urban District Council	T. F. Harvey, Town Hall, Merthyr.
IRON AND STEEL:			
July 13	Leeds—Pipes	Corporation	C. G. Hensell, Municipal Buildings, Leeds.
" 14	London, S.E.—Iron Fencing	London County Council	Parks Department, 11 Regent Street, S.W.
" 17	Leicester—Sluice Valves, &c.	Water Committee	J. B. Everard, 6 Millstone Lane, Leicester.
" 18	Wolverhampton—Iron Fencing	Hospital Board	Engineer's Office, Town Hall, Wolverhampton.
" 21	Valetta—Manhole Covers, &c.	—	Crown Agents for Colonies, Whitehall Gardens, S.W.
PAINTING AND PLUMBING:			
July 13	Lambeth, S.E.—Redecorating Premises	Borough Council	H. Edwards, 346 Kennington Road, S.E.
" 14	East Ham—Whitewashing, &c.	Education Committee	Education Office, East Ham.
" 14	Salford—Whitewashing	Guardians	Steward, Union Infirmary, Salford.
" 15	Isleworth—Painting Work, &c.	Burial Board	E. J. Partridge, Bank Chambers, 39 George Street, Richmond.
" 17	Bristol—Painting and Colouring at Schools	Education Committee	P. Addie, City Valuer's Office, Council House, Bristol.
" 17	Settle—Painting	Rural District Council	T. A. Foxcroft, Town Hall, Settle.
" 18	Leeds—Painting at Schools	Education Committee	W. Packer, Education Offices, Leeds.
" 20	Cork—Redecorating Interior of Church	—	S. F. Hynes, 21 South Mall, Cork.
" 21	Stockport—Interior and Exterior Painting	Watch Committee	J. Atkinson, Borough Surveyor, Stockport.
" 22	Conway—Oils, &c.	Town Council	Borough Surveyor, Town Hall, Conway.
" 25	Leeds—Painting, &c., Rooms	—	City Engineer's Office, Leeds.
Aug. 28	Gateshead—Cleaning and Painting at Schools	Education Committee	E. J. Harding, Education Offices, Gateshead.
ROADS AND CARTAGE:			
July 13	London, N.E.—Woodpaving	Hackney Borough Council	N. Scorgie, Town Hall, Hackney.
" 13	Khondra—Street Works	Urban District Council	W. J. Jones, Public Offices, Pentre, Rhondda.
" 13	South Mimms—Road Improvement	Rural District Council	W. H. Mansbridge, 40 High Street, Barnet.
" 13	Cardiff—Ballasting	Jones & Warne	C. T. Evans, 8, Queen Street, Cardiff.
" 13	Finsbury—Repairing Stone Steps	Radical Club	Secretary, Radical Club, Central Finsbury.
" 14	Dundee—Road Works	School Board	J. H. Langlands, 31, Murraygate, Dundee.
" 15	London, W.—Woodpaving	Paddington Borough Council	Borough Surveyor, Town Hall, Paddington.
" 17	Devonport—Street Cleansing, &c.	Corporation	R. J. Fittall, Town Clerk's Office, Devonport.
" 17	Paignton—Widening, &c.	Urban District Council	C. O. Baines, Town Hall, Paignton.
" 17	West Ham—Terrazzo Paving	Education Committee	W. Jacques, 2 Fen Court, Fenchurch Street, E.C.
" 18	Luton—Stones	Rural District Council	B. B. Franklin, 21, Market Hill, Luton.
" 18	East Barnet—Making-up Street, &c.	Urban District Council	H. York, Council Offices, Station Road, New Barnet.
" 18	Luton—Stones	Rural District Council	B. B. Franklin, 21, Market Hill, Luton.
" 18	London, S.W.—Roadwork and Platelaying	London County Council	County Hall, Spring Gardens, S.W.
" 18	Brentford—300 yds. Blue Guernsey Granite	Urban District Council	N. Parr, Clifden House, Boston Road, Brentford.
" 22	Conway—Portland Cement, &c.	Town Council	Borough Surveyor, Town Hall, Conway.

Tenders.

Kinnersley (Herefordshire).—Messrs. Groom & Betington, of Hereford, the architects for alterations and additions to Kinnersley Castle, point out in reference to the list of tenders on p. xxiv of our issue for last week that in accepting Mr. Powell's tender (the lowest but one) the time of completing the work was taken into consideration.

Slimbridge (Gloucestershire).—For the proposed Council School, Slimbridge, to accommodate 200 scholars, for the Education Committee. Mr. R. S. Phillips, surveyor:—

Common brick facing.

Workman & Sons	£2,442	3	11
W. T. Nicholls	2,189	0	0
W. Jones	2,160	0	0
A. S. Cooke	2,117	12	0
A. Estcourt & Son	2,100	0	0
Wall & Hook	2,038	0	0
H. J. Morgan & Sons	1,980	0	0
Byard & Sons	1,984	0	0
J. Gurney	1,987	0	0
Collins & Godfrey	1,970	0	0
Orchard & Peer	1,935	0	0
G. Dimery & Sons	1,960	5	3
S. Bloodworth & Son	1,950	0	0
W. Bowers & Co.	1,944	0	0
N. Baxter & Sons	1,920	0	0

Pressed brick facing.

Workman & Sons	2,462	3	11
W. T. Nicholls	2,000	4	6
W. Jones	2,193	10	0
A. S. Cooke	2,127	12	0
A. Estcourt & Son	2,124	9	0
Wall & Hook	2,071	13	0
H. J. Morgan & Sons	2,040	0	0
Byard & Sons	2,007	0	0
J. Gurney	1,998	10	0
Collins & Godfrey	1,993	0	0
Orchard & Peer	1,985	0	0
G. Dimery & Sons	1,978	19	5
S. Bloodworth & Son	1,975	0	0
W. Bowers & Co.	1,962	15	0
N. Baxter & Sons	1,949	18	8

* Accepted.

Stockport.—For the whole of the works required in the erection of the Chestergate new schools in Hardman Street, Chestergate, for the Education Committee. Messrs. Cheers & Smith, architects, Blackburn and London:—

Keen's cement dados.

T. Pickles, Luddenden Foot	£13,031	7	3
Bowman & Sons, Stamford	13,019	13	0
S. Warburton, Miles Platting	12,000	0	0
S. Smith, Burnley	11,038	4	8
J. H. Wood, Leeds	11,300	0	0
J. Gerrard & Sons, Swinton	11,220	0	0
W. B. Beattie	11,030	0	0
J. & W. Meadows	10,898	0	0
J. Broadhurst	10,895	0	0
W. Hopkins, Birmingham	10,600	0	0
W. Pownall	10,496	14	11
Robinson & Son, Hyde	10,489	6	7
J. Briggs	10,350	0	0
W. C. Broadhurst	10,285	15	0
D. Mullaney	10,160	0	0

Alternative tender.—Glazed brick dados, &c.

Bowman & Sons	£14,439	0	4
T. Pickles	14,404	1	9
S. Warburton	13,264	0	0
J. H. Wood	13,113	6	c
S. Smith	12,913	8	8
W. B. Beattie	12,455	0	0
J. Broadhurst	12,220	0	0
J. Gerrard & Sons	12,183	0	0
J. & W. Meadows	12,095	0	0
J. Briggs	11,710	0	0
W. Pownall	11,681	14	6
W. Hopkins	11,600	0	0
Robinson & Son	11,518	6	1
W. C. Broadhurst	11,423	7	4
D. Mullaney	11,229	0	0

[Rest of Stockport.]

Tir Phil (Wales).—For the erection of twenty or more cottages at Tir Phil, for the Tir Phil Building Club. Mr. P. Vivian Jones, architect and surveyor, Penegod:—

Jewel & Davies, Deri	£3,600	0	0
W. & D. Thomas, Bedwas, Mon.	3,400	0	0
T. Davies, Merthyr	3,370	0	0
Gibbon & Sons, Cardiff	3,196	16	8
Vodden & Lee, Gilfach, Pengam	3,080	0	0
R. Lloyd, Cefn Coed, Merthyr Tydfil	2,900	0	0
Sketchley & Co., Abergavenny	2,797	10	0

* Accepted.

(Continued on page xviii.)

The Lady Chapel in Winchester Cathedral has been adorned with an elaborate oak and mahogany reredos richly painted and gilded. The subject is the Annunciation, and the work was designed by Mr. J. A. Kempe.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending July 7th twenty-one failures in the building and timber trades in England and Wales were gazetted.

J. J. GODFREY, builder, Coventry.
FOWLER BROTHERS, decorators and building contractors, Stratford and Goodmayes. Adj. June 26th.

T. ROGERS, plumbers and painters' general merchants, Urmoston and Manchester. R.O. June 28th.

W. N. RICHARDSON, painter, paperhanger and decorator, Leicester. R.O. July 1st. Adj. July 1st.
W. THEOBALDS, architect and surveyor, 29, Bridge Row, E.C., and South Norwood. R.O. June 29th.

J. HARLEY & SON, builders, Smethwick. Adj. June 27th.

W. GUEST, painter and plumber, Dudley. Liabilities £731; deficiency £487.

A. E. VALLINTINE AND J. S. CHANDLER, plumbers and painters, Dover. Liabilities £178; assets £78 12s.

W. J. KENNEY, architect, Birkbeck Bank Chambers, London. Liabilities £283 12s. 2d.; assets £166.

W. C. HODGES, builder, Kempsey. Gross liabilities £215 16s. 11d.; assets £15.

A. E. LONGDEN, building contractor, Eastville, Bristol. Liabilities £751; assets £641.

J. PVEY & SONS, builders and house decorators, Anerley. Liabilities £833; assets £175.

H. CROOKES, builder, Sheffield. Gross liabilities £1,816; £591 expected to rank for dividend; assets £410.

H. GREGORY, builder, Woburn. P.E., Luton C.C., July 27th, at 11.30.

J. HUNT, surveyor, Old Trafford. R.O. June 26th. P.E., Salford C.C., July 24th, at 11.

G. THORNBY, builder and contractor, Ashby-de-la-Zouch. P.E., Burton-on-Trent C.C., July 19th, at 12.

C. BUTLER, builder, Bow and Leigh-on-Sea. R.O. June 27th. P.E., Bankruptcy Court, Aug. 2nd, at 11.

T. J. THOMPSON, painter and decorator, Church Stretton.

W. BOUGHEY, builder, New Brighton. Liabilities £1,693; assets £2,512.

WALLEY & SONS, builders and contractors, Wolstanton (late Stoke-on-Trent). P.E., Town Hall, Hanley, July 26th, at 11.

R. HUNT, builder and contractor, Sheffield. Gross liabilities £18,699; £1,562 expected to rank for dividend; assets £2,688.

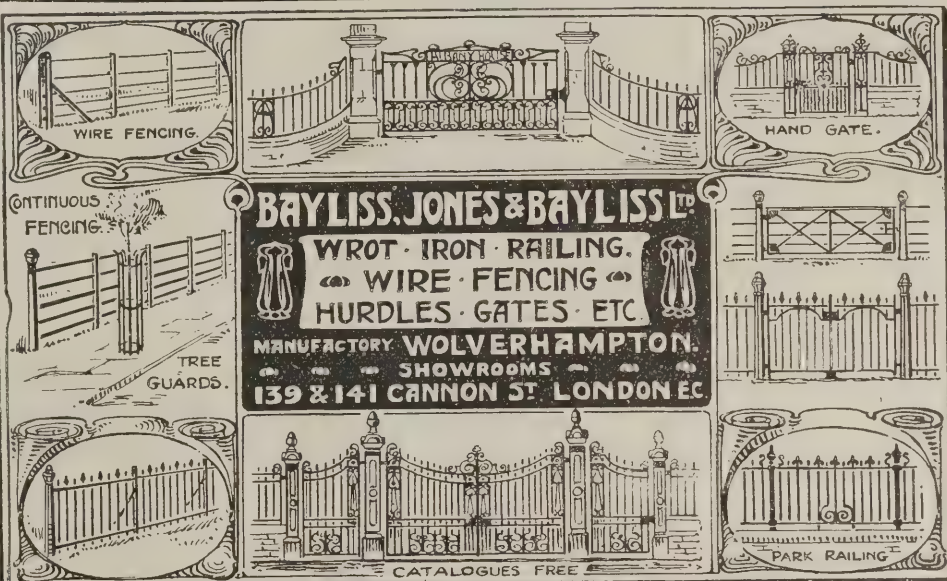
T. EMSDEN, builder, Ipswich. First meeting, O.R.'s, Ipswich, July 14th, at 2. P.E., Shirehall, Ipswich, July 14th, at 10.30.

W. MILLWARD, painter, Merthyr Tydfil. R.O. June 27th. P.E., Town Hall, Merthyr Tydfil, July 26th, at 3. Adj. June 27th.

J. & W. H. HITCHENS, painters and decorators, Penzance and Redruth. First meeting, London Bankruptcy Court, July 14th, at 12. P.E., Town Hall, Truro, July 15th, at 11.45.

J. HELLARSHALL, builder, Addison Road, King's Heath. Liabilities £1,010 10s. 8d.; assets £935 10s. 8d. Bankrupt was a journeyman bricklayer up till 1880, when he commenced business without capital as a speculative builder.

G. CROSSLEY & Co., quarry-owners and stone merchants, Bradford. R.O. June 30th. First meeting, O.R.'s, Bradford, July 14th, at 3. P.E., Bradford C.C., Aug. 2nd, at 10. Adj. June 30th.



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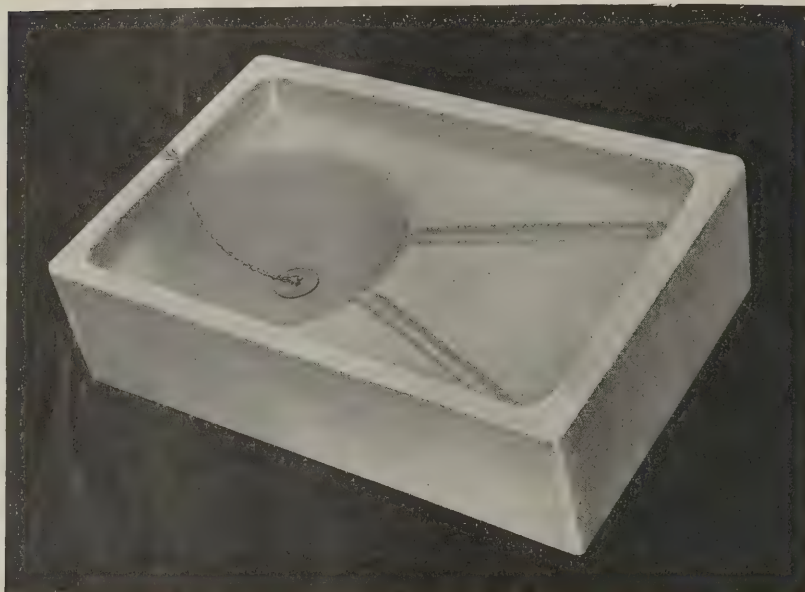
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Complete List of Contracts Open.—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ROADS AND CARTAGE—cont.			
July 22	Levenshulme—Paving, &c.	Urban District Council	James Iepson, Guardian Chambers, Tiviot Dale, Stockport.
" 22	South Shields—Service Line	Town Council	S. E. Burgess, Chapter Row, South Shields.
" 26	London—Making Roads, &c.	Metropolitan Asylums Board ...	Treadwell & Martin, 29A Charing Cross House, Charing Cross Rd., W.C.
SANITARY:			
July 14	Grassington, near Skipton, Yorks—Sewers, &c.	Rural District Council	H. A. Johnson, 15, The Exchange, Bradford.
" 14	Edinburgh—Convenience	City Council	Borough Engineer, Edinburgh.
" 15	Prospect—Sewerage Works	Cockermouth R.D.C.	J. B. Wilson 11, Main Street, Cockermouth.
" 17	Devonport—Street Cleaning, &c.	Corporation	R. J. Fittall, Town Clerk's Office, Devonport.
" 17	Eccles—Sewerage Works Extensions	Urban District Council	A. W. Wills, Sewage Works, Peel Green Road, Patricroft.
" 17	Hale—Sewers	Hospital Board	Council Offices, Astley Road, Hale, Cheshire.
" 18	Wolverhampton—Disinfectors	Corporation	Engineer's Office, Town Hall, Wolverhampton.
" 19	Middleton—Sewer	Corporation	W. Wellburn, Borough Surveyor, Middleton.
" 19	Hull—Removal of Nightsoil	Corporation	Office of Inspector of Nuisances, Hanover Square, Hull.
" 19	Brewold, near Stafford—Sewerage Works	Rural District Council	H. M. Whitehead, Penbridge, Stafford.
" 22	Conway—Drain-pipes, &c.	Town Council	Borough Surveyor, Town Hall, Conway.
" 31	Hawarden, Flint—Sewerage Works	Rural District Council	E. S. Taylor, 26, Newgate Street, Chester.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
July 27	Bexhill, Sussex—School	£50, £30 and £20	£1 IS.	Secretary, Education Committee, Amherst Road, Bexhill.
Aug. 1	Hove, Sussex—Library	£50, £30, £20	£1 IS.	H. Endacott, Town Hall, Hove.
" 1	Perth—Reconstruction of Hall... ..	30, 20 and 10 guineas	—	J. Begg, City Chambers, Perth.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

Current Market Prices.

FORAGE.

	£ s. d.	£ s. d.
Beans per qr.	1 10 0	1 13 0
Clover, best per load	3 15 0	4 2 6
Hay, good do.	3 10 0	3 15 0
Sainfoin mixture do.	3 10 0	3 17 6
Straw do.	1 12 0	2 0 0

OILS AND PAINTS.

Castor Oil, French per cwt.	1 0 5	—
Colza Oil, English do.	1 3 0	—
Copperas per ton	2 0 0	—
Lard Oil per cwt.	2 15 0	2 17 0
Lead, white, ground, carbonated per ton	16 0 0	—
Do. red do.	15 0 0	—
Linseed Oil, barrels per cwt.	1 0 1 3	—
Petroleum, American per gal.	0 0 5 8	0 0 5 8
Do. Russian do.	0 0 5	—
Pitch per barrel	0 8 0	—
Shellac, orange per cwt.	7 15 0	—
Soda, crystals per ton	3 2 6	3 5 0
Tallow, Town per cwt.	1 4 0	—
Tar, Stockholm per barrel	1 6 6	—
Turpentine per cwt.	2 4 10 3	—

METALS.

Copper, sheet, strong per ton	80 0 0	—
Iron, Staffs., bar do.	5 12 6	8 0 0
Do. Galvanized Corrugated sheet do.	10 15 0	—
Lead, pig, Soft Foreign do.	13 11 3	—
Do. do. English common brands do.	13 16 3	—
Do. sheet English, 3lb. per sq. ft. and upwards do.	14 0 0	—
Do. pipe do.	15 0 0	—
Nails, cut clasp, 3in. to 6in. do.	9 5 0	—
Do. floor brads do.	9 0 0	—

	£ s. d.	£ s. d.
Steel, Staffs., Girders and Angles per ton	5 7 6	5 12 6
Do. do. Mild bars do.	6 0 0	6 5 0
Tin, Foreign do.	140 10 0	141 0 0
Do. English ingots do.	140 15 0	142 10 0
Zinc, sheets, Silesian do.	26 15 0	—
Do. do. Vieille Montaigne do.	27 0 0	—
Do. Spelter do.	24 2 6	24 8 9

TIMBER.

Soft Woods.

Fir, Dantzic and Memel per load	2 15 0	5 5 0
Pine, Quebec, Yellow do.	4 0 0	7 10 0
Do. Pitch, American do.	3 0 0	5 0 0
Laths, log, Dantzic per cu. fath.	4 0 0	6 0 0
Deals, Archangel (Kem), Yellow, 2nd, 3x11 per std.	14 0 0	—
Do. do. 4th, 3x11 do.	7 15 0	—
Do. do. 3d, 3x9 do.	8 10 0	—
Do. Petschora, Yellow, 3rd, 3x11 do.	9 15 0	—
Do. Gefle, do. 5th, 3x11 do.	4 15 0	—
Do. Swartvik, Yellow, 3x9 do.	6 10 0	—
Do. Pensacola pitch-pine, 3x9 do.	10 10 0	—
Do. Gambley, Yellow, Unsorted, 3x7 do.	8 10 0	—
Do. Langror, Yellow, 2 3/4 x 11 do.	6 0 0	—
Do. Stromma, Yellow, Unsorted, 2 3/4 x 7 do.	8 15 0	—
Do. St. Petersburg, Yellow, 1st, 2 3/4 x 7 do.	9 5 0	—
Do. Kovda, Yellow, do. do. 3rd, 3x9 do.	10 10 0	—
Do. do. 4th, 3x9 do.	9 0 0	—
Do. Söderhamn, Yellow, 3rd, 3x9 do.	11 15 0	—

	£ s. d.	£ s. d.
Deals, Bjorneborg, Yellow, 4th, 3x7 per std.	8 0 0	—
Do. do. do. 2 3/4 x 9 do.	8 0 0	—
Do. do. do. 2 3/4 x 7 do.	8 10 0	—
Do. do. White, 4th, 2 3/4 x 7 do.	8 0 0	—
Do. St. Petersburg, Yellow, 3rd, 2 3/4 x 11 do.	7 15 0	—
Do. Blankaholm, Yellow, 1st, 2 3/4 x 7 do.	9 10 0	—
Do. Saguenay, Spruce, 2nd, 3x9 do.	9 5 0	—
Do. do. 3rd, 3x9 do.	8 10 0	—
Do. Quebec, Spruce, 3rd, 3x9 do.	8 10 0	—
Battens, all kinds do.	6 10 0	11 10 0
Flooring Boards rin. prepared, 1st per square	0 10 3	0 11 0
Do. 2nd do.	0 10 0	—
Do. 3rd, &c. do.	0 7 3	—

HARD WOODS.

Ash, Quebec per load	3 17 6	7 5 0
Birch, New Brunswick do.	2 5 0	4 17 6
Do. Quebec do. do.	2 10 0	5 10 0
Box, Turkey per ton	7 0 0	20 0 0
Cedar, Cuba per ft. sup.	0 0 3 1/2	0 0 3 1/2
Do. Honduras do.	0 0 5	—
Do. Tobasco do.	0 0 5	—
Elm, Quebec per load	4 0 0	8 10 0
Jarrah, planks per ft. cu.	0 2 6	0 3 0
Mahogany, Average Price for Cargo, Honduras per ft. sup.	0 0 3 1/2	—
Do. Tobasco do.	0 0 5 1/2	—
Do. Cuba do.	0 0 2 3/4	—
Do. African do.	0 0 3 3/4	—
Oak, Wainscot per log.	3 0 0	6 15 0
Teak, Indian, logs per load	10 0 0	19 0 0
Do. do. planks do.	13 0 0	20 10 0
Whitewood, American, logs per ft. cu.	0 1 3	0 1 6
Do. do. planks and boards do.	0 1 3	0 3 0

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HENRY TANNER, JR., } Hon. Secs.
A. MARVON WATSON, }

EXHIBITION OF DRAWINGS.

An exhibition of School of Design Drawings will be on view at 18, Tufton Street, Westminster, from Friday, July 7th, to July 15th (10 a.m. to 7 p.m.). The Prize Drawings will also be on view.

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Four lines or under (about 30 words)	1	6
Each Additional Line (about 7 words)	0	6
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The Secretary of State for War is prepared to receive Tenders for the purchase of surplus Boilers, Distilling Apparatus, Dynamos, and other plant now lying at Bermuda, Barbados, St. Helena, and Woolwich, most of which is in first-rate condition, some lots being unused.

Forms of Tender, giving full description of the plant, particulars as to condition of the several lots and terms of contract, may be obtained on application to the undermentioned Office.

The Tenders are to be delivered at the War Office, Pall Mall, London, S.W., by TWELVE o'clock noon on 1st September, 1905.

War Office,
Pall Mall, S.W.
3rd June, 1905.

TO BUILDERS AND CONTRACTORS.

TENDERS are invited for the ERECTION of 40 HOUSES near Tyers Arms, Blaina, Mon., for the Blaina Building Club.

Plans and Specifications can be seen at 7, Queen Street, Nantyglo, Mon. Specification can be obtained upon deposit of £1 is., which will be returned on receipt of a bona-fide Tender.

Sealed and endorsed Tenders to be sent to the Chairman of the Committee, THOMAS JONES, Esq., Bronfin House, Blaina, Mon., on or before July 12th, 1905.

The lowest or any Tender not necessarily accepted.

WILLIAM THOMAS,
Architect and Surveyor,
Nantyglo, Mon.

CENTRAL FINSBURY RADICAL CLUB.

326, City Road, E.C.

The Committee of the above club are prepared to receive TENDERS for REPAIRING a Set of STONE STEPS leading to their Lecture Hall.

Specification may be seen by applying between the hours of TWELVE and THREE o'clock.

Tenders, endorsed "Repairs to Steps," must be addressed to the SECRETARY not later than THURSDAY, THREE o'clock, JULY 13th.

C. W. HARDING,
Secretary.

EMPLOYMENT REGISTER.

Too late for Classification.

- 1227.—GENERAL OR WORKING FOREMAN (Carpenter), alterations; sole charge, jobbing, &c.; exp. in all branches.
- 1231.—FOREMAN OF JOINERS; accurate setter out; good refs.
- 1232.—ARCHITECT'S ASSISTANT; contract drawings, details, surveying; mod. s.
- 1233.—ARCHITECT'S ASSISTANT (A.R.I.B.A.); Prov. preferred; extensive experience; design details, and exp. quan. sur.; ex. refs.; mod. s.
- 1235.—PAINTERS' WORKING FOREMAN; good all-round man, exp. of all branches; good references; abstainer.
- 1236.—PAINTER; good all-round hand; town or country; abstainer.
- 1237.—ARCHITECT'S ASSISTANT (32); exp. draughtsman; specifications and quantities; sal. 55s.; country preferred.
- 1238.—ARCHITECT AND SURVEYOR'S ASSISTANT; exp. and capable; quantities, wkg. drawings, steelwork construction, details, surveying and levelling; mod. s.
- 1239.—PLUMBER, young; gas and hot-water, zinc, and electric bells; exp. in latest sanitary improvements.
- 1240.—ARCHITECT AND SURVEYOR'S ASSISTANT, 3½ yrs. varied exp.; wkg. drawings, surveying, levelling, &c.; mod. s.
- 1241.—DRAWINGS, DESIGNS, DETAILS, SPECIFICATIONS, Drain Plans and Quantities prepared. Terms mod.
- 1242.—CLERK OF WORKS OR ASSISTANT. Good draughtsman, setter out. Sanitary engineering. Quantities, practical, trustworthy.

See p. xxii for the Employment Register.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.

OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

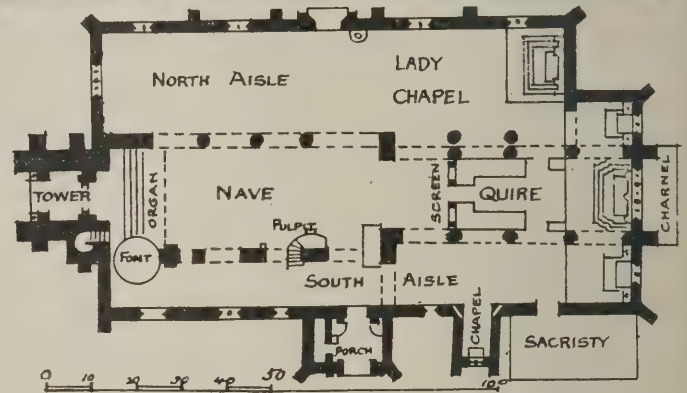
VILLAGE ARCHITECTURE IN FINISTERE.

(Concluded from p. 20, No. 544.)

PLUGASNOU is a place of some importance, and boasts a mayor and a "percepteur," or rate collector, not to mention a convent and three priests. There is a good-sized square in the middle of the village, on one side of which is the church, standing in a large cemetery and surrounded with stunted beech trees. The church is a strange jumble of work of all dates and styles, an architectural conundrum, which in some respects almost defies solution. Thus the south arcade of the nave has plain square piers and arches, two of which are round and one pointed, and whether this is of eleventh- or of seventeenth-century work it is hard to tell. As, however, the westernmost bay of the arcade is undoubtedly seventeenth century, and as it is of quite different character to the rest, it is at least possible that the plainer parts of the work may be the remains of an early church. According to this theory the original building would seem to have been an aisled Romanesque church with transepts, the large pointed arch of the south arcade having been that of the south transept. The chancel was rebuilt in a very English manner, with octagon piers and chamfered arches, some time about the end of the fourteenth century. This part of the church is carefully built in granite ashlar work, the east window being of six lights with reticulated tracery. Afterwards the north aisle was rebuilt in late Flamboyant style, with an arcade of moulded arches dying into round pillars. The work in this part of



PLUGASNOU
CHURCH.

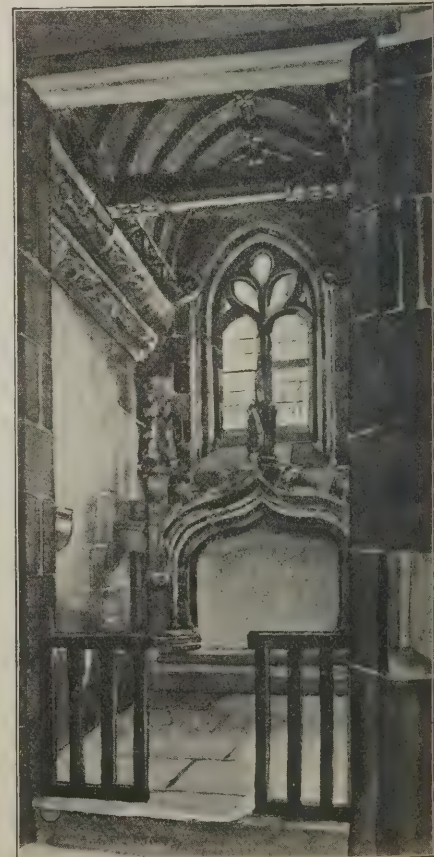


the church is less excellent than that in the chancel – the walls of rubble instead of ashlar, the buttresses lean and widely spaced, the windows mis-shapen. Evidently the village had grown and the church had to be enlarged as cheaply as possible. At this period circular pillars were built up at the backs of the octagonal ones on the north side of the chancel, as if it had been intended to rebuild the whole church to match the north aisle; but this work, if ever contemplated, was not carried out, and now these pillars run sheer up to the aisle wall-plate without any arches at all. In the seventeenth century another scheme of rebuilding was set in hand, but all that was done was to replace the western bay of the south arcade with clustered pilasters and wooden architraves, to rebuild the south aisle wall, and to build a new steeple and the south porch. These successive alterations have left us a most pictorial church, interesting and delightful as a piece of history, but not a coherent design such as we have in churches like Lanmeur or St. Jean du Doigt. It is long and low, with a big slated roof over nave and south aisle and a separate span of roofing to the north aisle. The one really beautiful piece of detail is the tiny chantry built out from the south aisle of the chancel. This measures only about 12ft. by 7ft. 6ins. inside, but it is wonderfully finished. The south gable has large crockets and a finial as if for a statue, below which is a two-light window set in deep mouldings. Under this window, inside the chapel, is an ogee-canopied tomb with a finial carrying a quaintly treated representation of the Blessed Trinity carved in wood and painted. On the east wall are image brackets above the site of the altar, and carved double cornices in granite carry an elaborate coved roof of the local type with a miniature tie-beam in the centre held in dragons' mouths.

The seventeenth-century work in the tower and nave is very Jacobean looking, carefully



CHAPEL PLUGASNOU CHURCH.



CHAPEL, PLUGASNOU CHURCH.

built but rudely ornamented. As a piece of design, however, the tower and its spire are most effective. They are built entirely in dressed granite, the lower stages having bold massive buttresses and balconies between, which recall the open galleries at St. Jean du Doigt, but are perhaps more effective from their bolder projection and greater variety.

Renaissance steeples are not uncommon in Brittany. There is a well-known example at Roscoff, besides those at Plougasnou and Lanmeur. And should the patriotic British tourist see Plougasnou steeple and think on Bow Church, let him reflect that the humbler of the two fits its surroundings no less than the more ambitious, and that Bow steeple would be no less out of place in a quiet country churchyard than Plougasnou spire in the middle of Cheapside.

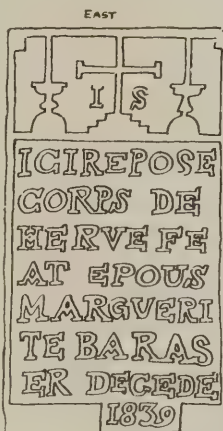
The interior is full of romance, from its extraordinary lack of symmetry and order. Each generation has left its mark on the place, and the ghosts of its builders seem to haunt its mysterious recesses. Moreover, the church has an added charm from retaining much of its old furniture. The lower part of the rood screen stands in its place at the entrance of the chancel, which is fitted with simple seventeenth-century stalls and enclosed with wooden parcloles of the same date. There is a big gabled lectern in the quire, and the high altar has an early Renaissance reredos consisting of three delicate open-work turrets in metal with pierced tracery work between them. There is a splendid silver processional crucifix with figures of Our Lady and St. John and little bells hung about the Cross. In the west gallery is a large disused organ. The font is plain and enclosed with a simple balustrade of wood, and, in a forgotten corner of the north aisle, covered with dust and hidden behind a pile of chairs and lumber, is an altogether admirable wooden lectern with a great gabled desk and a support of wooden pillars. An interesting piece of furniture stands against the south-east pier of the nave: it is an altar-like slab of stone with a square sinking in the middle supported on clumsy seventeenth-century balusters. At present it is used as a shelf for candlesticks that are not in use, but it was apparently designed either for a "cresset stone" or else for a kind of credence for offerings.

The churchyard is full of gravestones of a rather singular type. Most of these are plain flat slabs, though a few are slightly raised after the manner of altar-tombs. The slabs are carved almost invariably with a cross between a pair of candlesticks, below which is an inscription in raised letters. Each grave has a receptacle for holy water, either sunk in the slab itself or else in the form of a small stone basin, and these are from time to time replenished from the stoup in the church porch.



PLOUGASNOU CHURCH.

Until a year or two ago Plougasnou churchyard possessed a mortuary-chapel and a tall stone cross with a stone Gothic pulpit at its base. These have been taken down and rebuilt stone for stone in the new cemetery; and in 1896 the "commune" had



Grave Slab
Plougasnou
30.9.96 CAN

an odious project for turning the old churchyard into a public garden and uprooting the old tombstones. The craze of "new lamps for old—new lamps for old" has made itself felt, too, inside the church, where (in 1896) the last of a series of simple old seventeenth-century confessionals was replaced with a modern Gothic affair in varnished chestnut picked out with black lines. The south side of the church has also been recently repointed in staring

white mortar, and all the old furniture of the building has been grained. A few years ago it was painted a cool green in admirable harmony with its surroundings. A wide sandy beach extends along the channel coast from Plougasnou to St. Jean du Doigt, but to the west of Plougasnou the shore is steep and rocky as far as the fishing village of Trégastel, situate on a broad estuary with distant views of the spires of St. Pol de Léon across the water. The rocks at Trégastel are worn into fantastic shapes and enclose a harbour for a small fleet of fishing smacks. The village itself is swamped by an immense hotel, but on the cliffs between Plougasnou and Trégastel stands a little seventeenth-century chapel with its original altar and fittings very much in the condition in which its builders left it. On the Trégastel-Plougasnou road is a stone manor-house with round extinguisher-capped tower, standing in a deep green valley, surrounded with trees and partly overgrown with creepers. This house forms one corner of a quadrangle around which the farm buildings are placed. On the Plougasnou-Morlaix road is a hamlet with a small church adjoining and almost indistinguishable from a group of stone cottages. Church and cottages both appear to date from the seventeenth century. Past occasional wayside crosses and distant village spires, the road takes us back to Morlaix, a town full of architectural and historic interest but at which, as being by virtue of its railway station the gate of the outer world, we may fitly end our glimpse of Finistère village architecture.

In the churches that have been described there is great variety of arrangement and "motif," although their details show a strong family likeness. The larger houses, and even the cottages, are all without exception built of great blocks of granite, and it is only in



SEVENTEENTH-CENTURY CHAPEL NEAR PLOUGASNOU.



MANOR HOUSE ON TREGASTEL-PLOUGASNOU ROAD.



CHURCH AND COTTAGES ON PLOUGASNOU-MORLAIX ROAD.

the unimportant details that the earlier work differs from the later. Instances occur of rubble buildings plastered between stone dressings and quoins, but even in these cases the unusual size of the stones used gives the prevailing local flavour to the work. To eyes accustomed to the prettiness of brickwork the use of these ponderous materials gives an air of distinction to the smallest cottages. Several houses in Morlaix near the Carmelite fountain, though of perfectly plain design, are nevertheless quite imposing from the nature and treatment of their materials, but buildings such as these miss alike the cheeriness and comfort of our English brickwork and that indescribable refinement which we find in our domestic work in freestone districts such as Somerset and Northants. All these kinds of buildings, however, are alike in that they reflect their builders' temper, and therefore each is worthy of study in equal degree.

The building materials native to North Brittany are granite and slate. The granite where used as ashlar is usually built with very wide joints, especially in the later work. Rubble walling is generally uncoursed in the district, the stones being often mere boulders untouched with the tool. The slates used north of Morlaix are mostly a small greenish variety of stone slates, but in other parts of Brittany thin purple and blue slates from Angers are the commonest roof-covering. The usual gauge of the slating is about gins., the slates varying from 6ins. to 9ins. in width, but some of the stone slates are occasionally rather larger than this. Generally speaking, the texture and colour of the old

and some of the newer buildings is delightful, and the work of the district gives ample proof, if proof is needed, that good building looks better than mediocre "architecture." The buildings that have been described are not a specially-selected series, and are all situate in a small and not wealthy district. But here, as in many parts of England and the Continent, one may find much that is worthy of study in a small compass, and an atmosphere of old traditions and ways of building which cannot but have a certain



HOUSES IN MORLAIX.

invigorating effect upon work which has to be done under conditions more adverse than those under which were produced the masterpieces of our forefathers. C. A. N.

IN PARLIAMENT.

(By Our Press Gallery Representative.)

Revised Regulations for School Planning.

THE Board of Education has presented to Parliament a set of building regulations relating to the planning and fitting up of new buildings for public elementary schools. One of the first-mentioned principles to be observed is that the rooms must be grouped compactly and conveniently so as to secure proper organization and supervision. It is important to remember that the number of places provided in any room depends not merely on its area but also on the lighting, the shape of the room, and the position of the doors and fireplaces, which should be arranged so as to allow the whole of one side of any room to be left free for the groups of desks. For large departments containing from 350 to 500 places the most suitable plan is that of a central hall, with the classrooms grouped round it. As a rule such a department would require from seven to ten classrooms. Smaller departments may be planned conveniently with the classrooms opening from a corridor; and a similar plan may be adopted even for larger departments. Where the site is sufficiently large, open and fairly level, the most economical plan is that in which all the rooms are on the ground floor, and this arrangement is preferable on educational grounds. It is

desirable that a building for use as a public elementary school should be on not more than two floors.

Where there is a central hall it should have a floor space of not more than 4 sq. ft. for each scholar for whom the school is recognized. About $3\frac{1}{2}$ sq. ft. for each scholar will be sufficient. Where outdoor space is not available, physical training should be given in the central hall or corridor, and this purpose should be taken into consideration at the time when the building is planned.

Since fixed gymnastic apparatus is unsuitable for children under fourteen years of age, a separate gymnasium is not required and cannot be approved.

Corridors.

Large schools not built with a central hall must be provided with a wide corridor giving access to the rooms, and two or three of the rooms ought to be divided from one another by movable partitions.

A corridor should be fully and directly lighted and ventilated and from 8ft. to 12ft. wide.

Where a schoolroom is the principal room in a school which has neither central hall nor corridor it should never be designed for more than 100 children, and a room of even smaller size is desirable.

No schoolroom lighted from one side only can be approved. The gable ends should be fully utilized for windows, and there should be no superfluous windows opposite the teacher.

When a school consists of a single room that room should not contain more than 600 sq. ft. of floor space. Both schoolrooms and classrooms must have independent entrances. A classroom should not be planned to accommodate more than fifty to sixty children, but in special cases somewhat larger rooms may be approved. In the absence of supplementary light the measurement from the window wall in a room 14ft. high should not exceed 24ft. 8ins. A room approximating to a square is most satisfactory.

Infants' Schools.

After directions regarding desks, the Board point out that in the case of a building for older scholars the plans for the schoolroom and classrooms must show an average of not less than 10 sq. ft. of floor-space for each place proposed to be provided. In the case of infants' schools it is suggested that the partitions between them and other school or classrooms should be impervious to sound. The infants' school and playground should always be on the ground floor, and no classroom should accommodate as a rule more than sixty infants. The plans must show, in the case of a building erected wholly for the use of infants, an average of not less than 9 sq. ft. for each place. Provision must also be made for exercise.

A number of detailed directions are given as to rooms for cookery, handicraft, &c. In the case of higher elementary schools the curriculum should be determined before the architect is instructed. It is pointed out, however, that for a school accommodating from 300 to 350 scholars eight to ten classrooms will generally be required, none of which should accommodate more than forty scholars. Numerous directions are given as to the classrooms for different subjects.

A number of important rules follow relating to sites and playgrounds, walls, floors and roofs, entrances, staircases, cloakrooms, lavatories, lighting, ventilation, warming, sanitary arrangements and water-supply. Before recognising newly-erected premises as suitable for a public elementary school, the Board must be satisfied by the submission of plans that the building regulations have been complied with. Directions are also given as to the manner in which plans are to be prepared for submission to the Board.



HOUSES IN MORLAIX.

The rules and regulations cover fourteen pages of foolscap.

Charing Cross Subway.

In the House of Commons last week Sir Walter Plummer asked Lord Balcarras whether his attention had been called to the Bill now before Parliament for constructing among other things a subway commencing on the south side of Charing Cross and terminating near the south-east corner of the base of the Nelson Monument, and whether His Majesty's Office of Works could do anything to prevent this further encroachment upon Trafalgar Square, which had already been disfigured by the subway which was at last approaching completion.

Lord Balcarras said the answer to the first paragraph of the question was in the affirmative. The plans and drawings had all been seen and approved by the First Commissioner, who was satisfied that no disfigurement would be caused. The encroachment referred to was small in comparison with the advantage of the subway to the public.

WORKMEN'S HOUSES AT SHEFFIELD.

THE accompanying illustration shows a portion of a block of twenty houses proposed to be erected by the Sheffield Corporation at High Wincobank, about four miles from the centre of the city. The design was selected in a recent competition limited to Sheffield architects in which Mr. E. M. Gibbs, F.R.I.B.A., was assessor, the object being to provide cottages which would let at 5s. per week clear without being in any way chargeable on the rates. Each house contains on the ground floor a living-room 14ft. by 11ft. 7ins., a scullery 8ft. 6ins. by 8ft., a pantry, coal-place and w.c. A concrete bath is provided in the scullery, between the sink and copper. On the first floor there is a front bedroom large enough for two beds, while at the back are two bedrooms, each large enough for one bed. A wardrobe cupboard is provided on the landing. Each house has a separate front garden and a separate yard. The approach to the yard is by a 5ft. wide back passage parallel to the road, which gives access to a space behind, 60ft. deep, reserved for gardens. Tarred-wood fences will be used to divide the whole of the gardens and yards. The houses will be built of local stock bricks with blue-brick bands, and the roofs slated. Casement windows will be used throughout, and the woodwork will probably be painted white. The estimated cost is £2,520, or £126 per house, the contractor being Mr. W. Malt-house, of Albany Road, and the architect Mr. H. L. Paterson, A.R.I.B.A., of St. James Street, Sheffield.

IRISH ARCHITECTS AND REGISTRATION.

WE notice that in its issue for July 15th the "Irish Builder and Engineer" devotes a leader to the position of the Registration Bill. Referring to the collapse at the recent Institute elections our contemporary says: "What in all probability occurred is that the registration leaders did not organize and discipline their forces to combat reaction, while on the other hand the personal appeal made by the 'old gang' produced an immense impression upon the younger men in London and its vicinity. There are, roughly speaking, about 1,400 members of the Institute resident in England, and of these considerably more than half practice in London and its vicinity; so that London alone has a substantial majority, if we exclude Ireland, Scotland and places abroad. London has never felt the pressure of the unfair competition of ignorant so-called architects, nor indeed do the architects of any great city in the same sense as

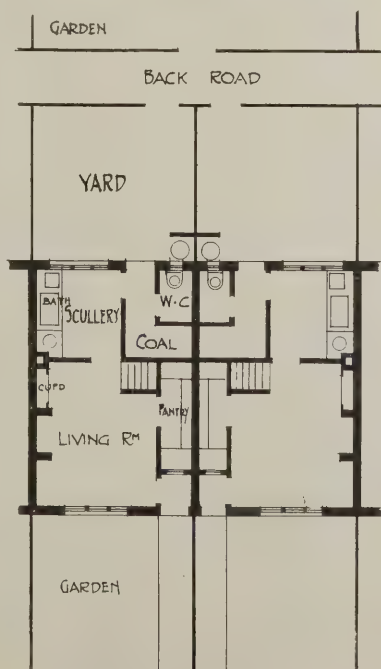
men in small country-places. Outside the Institute there is a great body of architects resident all over the provinces, Ireland and Scotland, mostly members of the various local institutes and societies, as well as the considerable membership of the Society of Architects, still practically unanimous in favour of registration.

The last election of Council has given the registration movement a most serious setback, which, nevertheless, cannot permanently affect the issue. . . . Meanwhile a question arises, How does Ireland stand? Ireland is in favour of registration, and we are convinced that a Bill promoted by the Irish Institute would receive the nearly unanimous support of the Irish members, for in no part of the whole empire is legislation more needed. Such a Bill ought to, and would be, received sympathetically by the British architects outside London. . . ."

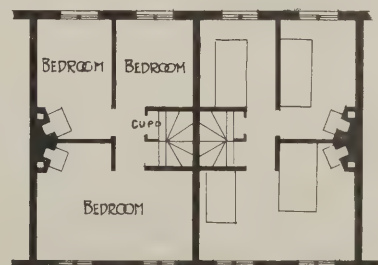
Law Cases.

Estate Development: An Architect's Claim for Fees.—In the Liverpool County Court last week Mr. William Hesketh, an architect and surveyor, sued Mr. J. H. Taylor, a builder, for £100, the cost of preparing plans for the laying-out of certain land at Tuebrook, including roadmaking, &c., for its ultimate development for sale in building plots. The defendant had paid into court £20 in full satisfaction of the claim and costs. It was contended on behalf of the plaintiff, and evidence was called to prove, that the defendant had consulted him in

reference to the development of an estate which he had purchased adjoining Maiden Lane and Lisburn Lane, in Clubmoor, Liverpool, and the work now claimed for had been done at the request of the defendant between September and December, 1903. So far as the plaintiff had to do with it, the development scheme was stopped by the defendant in a letter in February, 1904, and the plaintiff subsequently learnt that the defendant had disposed of a considerable portion of the land. Defendant's case was that he had never ordered an estate plan, upon which a large portion of the claim was based, nor had it even been supplied to him. For what was known as "the cottage block plan" an ordinary price for a builder would not be more than two or three guineas; while plaintiff had admitted that for the purposes of the estate plan he had never surveyed the land, but had prepared it from the Ordnance Survey plan. Defendant had acquired the land, containing nearly thirty acres, in August, 1903, for £5,500, and having paid a deposit of £300, in May of last year he sold 6½ acres of it to the London and North-Western Railway Co. for £4,036, while he had subsequently disposed of two or three other plots for about £1,400. Thus, having regard to what he had already sold, he said, the remaining twenty acres or thereabouts which he now possessed had practically cost him nothing. Having heard further evidence, his Honour Judge Collier decided that £50 was ample to meet the plaintiff's claim, and he gave judgment for that amount, including the sum paid into court.



ACCEPTED DESIGN FOR WORKMEN'S DWELLINGS TO BE ERECTED BY THE SHEFFIELD CORPORATION AT WINCOBANK. H. L. PATERSON A.R.I.B.A., ARCHITECT.



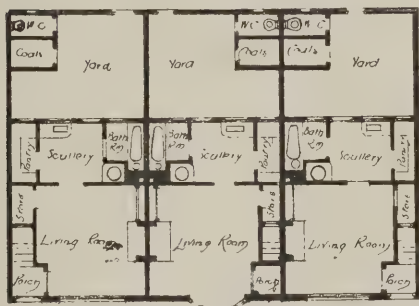
FIRST FLOOR PLAN

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COTTAGES AT PORT SUNLIGHT. T. TALIESIN REES, F.R.I.B.A., ARCHITECT.

These cottages are built of red bricks, with cement to the upper portion finished white, and the roofs tiled. The cost of the three was £800.



THE DECORATION OF WESTMINSTER CATHEDRAL.

WITHIN a short time the marble baldachino, with its eight massive columns, will be erected at Westminster Cathedral. It may be remembered that when the first set of these pillars arrived in England several were found to be broken; hence the delay with the work.

Another important feature to be dealt with almost immediately is the Cardinal Vaughan Chantry Chapel, which is situated near the opening of the Chapel of the Blessed Sacrament. Mgr. Dunn has this work in hand. The Byzantine arches, running the whole length of the chapel, are each to be divided by fine marble columns, the walls and roof will be embellished with marble and mosaics, and there will be a recumbent figure of the late Cardinal.

The Chapel of St. Paul is being collected for, and a fair amount of money has been received, but it is not expected that the work here will be commenced for some time.

In the baptistery the floor will shortly be paved in a very tasteful design in marbles, and similarly the other chapels lacking floor decoration.

The pulpit is to be moved against the great brick pier immediately in front of it, with the object of rendering the preacher more distinct in all parts of the vast building, and the base is to be taken away in front and replaced by short marble columns, which will give the whole a much lighter appearance.

The doors at the entrance should have been in position some time ago, and it will be a relief when they arrive, as the present makeshifts mar the beauty of the building as viewed from outside. They will be erected

as soon as the bronze-work is finished. It is not probable that the mosaic picture of "The Last Supper," which is to be placed over the entrance, will be commenced for many months.

When all the items named above have been completed and a few others have been added it is likely that there will be, for a time at least, a cessation in the work. There appears to be a feeling that although some progress should be made each year with it, the people of the present have built the cathedral, and those of the future should adorn it.

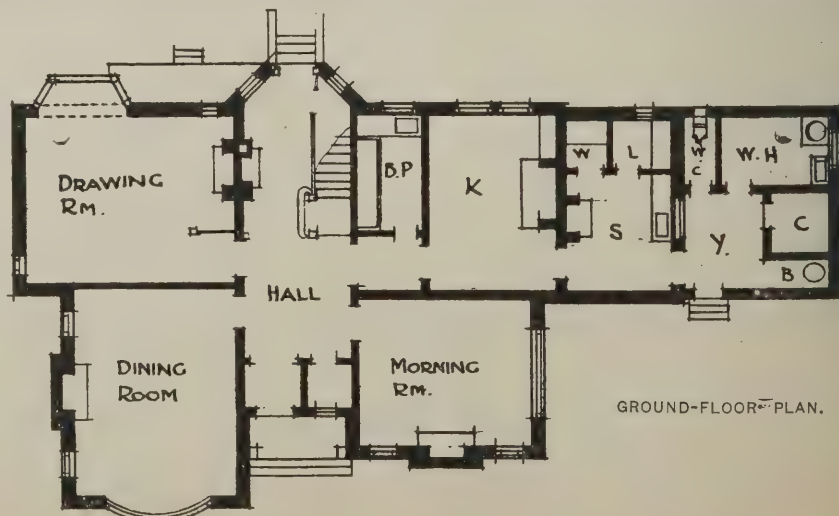
A new Roman Catholic Church has been erected at Normanton at a cost of £5,000. The building is in the Early Decorated Gothic style, and contains a nave 32ft. wide, aisles 6ft. wide, octagonal end, with chancel, side chapels, and vestries behind.

Edinburgh's Parliament Hall.—Much interest is being taken in the proposed restoration of the old Parliament Hall at Edinburgh. Mr. Oldrieve, architect, H.M. Board of Works, is in consultation with Sir James Guthrie, P.R.S.A., as to the tinting of the walls and the rearrangement of the pictures and statues. A new parquetry floor of oak and teak in. thick, set in panels, will be laid. The open oak roof is covered with many coats of varnish, and this is to be cleaned off to expose the old tone of the oak



HOUSE AT PRENTON. T. TALIESIN REES, F.R.I.B.A., ARCHITECT.

The building is of red Ruabon bricks and York stone, the upper portion being in cement-cast and half timbering, with tiled roof. The internal work, doors and fittings, are in white wood, finished with flat white paint, with the exception of the hall and dining-room, which are in English oak.



GROUND-FLOOR PLAN.



OLD LEAD TANK AT RICHMOND, SURREY.

This old lead tank is in the kitchen of the seventeenth-century house occupied by Mr. W. I. Chambers on Richmond Green. The house abounds with good things, noticeably the original carved gun-rack in the kitchen, the carved oak staircase with twisted rails and carved brackets, and a remarkable carved and perforated oak door in the hall. All rooms are panelled, and the bold external main cornice is a marvel of carving and preservation. Some of these old houses around the Green have fine moulded plaster ceilings, and the doorways and projecting hoods, mouldings and carvings provide a rich field of study for the student. By the crests on the tank it is generally supposed that the house was the residence of the Austrian ambassador of that date (1715).

Builders' Notes.

Durban Town Hall Contract.—The contract for the new town hall and public offices for Durban (illustrated in our issue for January 25th last) has been secured by Messrs. Cornelius & Hollis, a local firm. The estimated cost of the building is £237,945.

Property Values are stated to be somewhat on the down-grade in the City of London. A freehold purchased five years ago for nearly £8,000 has had to be sacrificed for a sum slightly in excess of £5,000. Experts are agreed that this is the day of huge blocks, and that the others will go steadily from bad to worse from the point of view of the owners.

The Cheap Cottages Exhibition at Letchworth (Garden City) is to be opened by the Duke of Devonshire at 4 p.m. on Tuesday next, July 25th. Those who wish to avail themselves of the special train leaving King's Cross for Letchworth at 2.25 are requested to inform the secretary (Mr. Wilbraham V. Cooper, 347, Birkbeck Bank Chambers, W.C.) of their intention.

Aspinall's Enamel, Ltd., have just successfully fought an action in Belgium against a firm who were selling goods bearing labels with the words "Email Aspinall," "Peinture Aspinall" and "Vernis Aspinall." The court awarded the English firm substantial damages, and ordered that all goods bearing the words "Aspinall" were to be withdrawn from the market.

Turpentine from Stumps of Pine Trees is being distilled in British Columbia. The lower parts of the trees are so full of the fluid that they are of no use for lumber, and by aid of stagings the upper parts are cut off above the turpentine section. An American company has put down a plant, and from single stumps is distilling as much as 75 gallons of turpentine, all of which is being sold in the Orient. When it is remembered that turpentine retails in Canada at from 90 cents to 1 dollar a gallon, it will be seen that the British Columbia enterprise is a valuable one.

The new patent Gas-Lime and Clinker Brickmaking Process is attracting some attention in Leeds. It is claimed that the bricks can be made at a lower cost and at the same time are of equal, if not of superior, quality to the ordinary building bricks. Messrs. W. Johnson & Sons, of the Castleton Foundry, Armley, have had contracts in hand for machinery for the manufacture of these bricks.

Lead Poisoning : Home Office Report.—A report by Dr. T. M. Legge, Medical Inspector of Factories, states that the existing special rules for processes in the manufacture of paints and colours, which have been in operation since 1892, are in need of revision; in particular it is pointed out that by far the greater number of cases of plumbism arise in occupations in which dust is raised in the mixing and grinding of white lead. This source of danger the existing rules do little to remove or diminish. The chief centres of the

paint and colour industry are East and South London, Liverpool, Glasgow, Hull, Manchester and Birmingham.

Labour in South Africa and Canada.—The Emigrants' Information Office, of 31, Broadway, Westminster, S.W., states that the building trade at Cape Town shows no signs of improvement, and at Port Elizabeth there is a good deal of distress owing to the depression. In Canada there has been good employment for skilled men in the building trade, the following having been especially busy:—Carpenters, bricklayers, masons, painters, paperhangers and stone-cutters, &c.

Competitions.

Rochester Technical Institute.—The assessor in this competition will be Mr. Frank T. Baggallay, F.R.I.B.A.

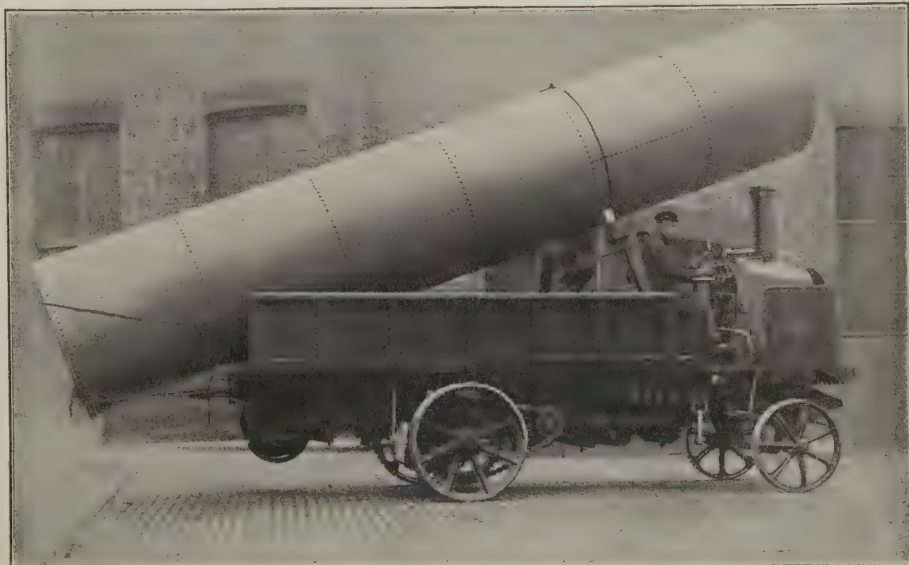
New City Hall, Perth.—The town council committee have agreed to allow an extension of a month for designs in this competition.

Branch Libraries at Cardiff.—In the announcement of this competition on p. 21 of our issue for last week an error occurs by the wrong insertion of a comma. The successful architects are Messrs. J. Allan Speir & Thomas A. Beavan, not "J. Allen, Speir & Beavan," as stated.

Scale of Charges for Assessing Competitions.—At the recent special meeting of the R.I.B.A. to consider amendments relating to competitions the following clause was adopted: "The usual R.I.B.A. scale of charges for assessing competitions is the sum of thirty guineas, plus one-fifth per cent. upon the estimated cost of the proposed building." Approval was given to the suggestion that assessors in making their awards be instructed to decide strictly according to the conditions of each competition.

TUBE STAIRCASES.

WE illustrate on this page a photograph of a portion of the air shaft of one of the staircases which is being erected for the Underground Electric Railways Co., Ltd. The contractors for this work are the St. Pancras Ironwork Co., of 171, St. Pancras Road, N.W., who have similar work on hand for the thirty or forty stations on the different tubes in London. The view shows the shaft being transported on one of the firm's steam wagons, of which we give detailed particulars on page xiii of our issue for March 8th last.



STAIRCASE AIR SHAFT FOR NEW TUBE RAILWAYS.

SOME PRACTICAL NOTES ON BRICKWORK.

By C. J. Wilson.

IN this article I propose to deal with brickwork in a modern building under the supervision of a clerk of works, himself a bricklayer.

We will assume that the concrete has been put in and levelled to the given height. First comes the setting-out of the building for the brickwork. This is done by squaring in off a given centre line or other point with the aid of a large wooden building square. If, as is often the case, by reason of some obstacle it is impossible to get the line down on the concrete, then it must be reproduced with the aid of a centre bob on to the bottom which has been prepared for the brickwork. Having done this, take distances or centres for the different walls, being very careful to make as many checks as possible.

Having set out the walls correctly, we can proceed with the building of them. Before any bricks are laid a level point should be produced down from the given datum, and a stout peg driven in, from which other levels must be produced to the principal points or corners of the building. Then make a gauge rod with every course carefully marked thereon, with the height of every template, window sill, door sill, stone heads, springing of arch, and height of floor on the particular wall on which work is to be commenced.

Laying.

Now the bricks can be laid. Have the concrete swept and damped, then start at either end of the wall and raise a corner to the height of the damp-course. If the wall is to be 2½-bricks thick, then the first course or footing will be 5-bricks thick. Care should be taken that the bricks are laid to what is now generally termed sectional bond, that is, the cross joint should continue in a straight line to the other side of the wall, thus obviating any straight joints in the centre of the wall. To my mind too much trouble cannot be taken in guarding against neglect of this, for on too many jobs the bond which looks so well on the outside is defective in the centre of the wall, where bats, pieces, compo and sometimes the scrapings of the scaffold are filled in. Another point which should not be overlooked is to see that the bricks are well damped, especially if cement and sand (technically called "compo") are being used; also see that the sand is clean and sharp, i.e., angular, and that the cement has been thoroughly air-slaked, otherwise it will swell slightly and angles will get out of plumb.

Care should be taken to see that the wall is thoroughly flushed up at every course, or, if this method of filling the joints is not approved, take care that the bricklayers put the cross joint through the whole length of the bricks on the outside, and that the middle of the wall is carried up. The compo and water is put in the middle of the wall to the required quantity and mixed to a proper consistency, after which the bricks are "swum" into their position, thus ensuring a joint all round the bricks, as well as a good solid job.

Another matter that requires attention is to see that the offsets on either side of the wall are kept regular, i.e., kept 2½ ins. each course—not 1½ ins. on one side and 3 ins. on the other, as often the case, with the result that there is not an equal distribution of the superincumbent weight over the whole of the footings.

The Damp-course.

Having levelled up to the damp-course, the asphalt is now put on. The work should be dry or the asphalt will not adhere to the brickwork, thus rendering the damp-course inefficient. If slates are to be used care should be taken that they are properly lapped and bedded solid, so as to prevent any breakage when the wall is built upon them.

Having laid the damp-course, proceed to set out the bond for piers and openings. All broken bond should be worked into the centre of the opening, so avoiding broken bond in the piers. Having set out the bond, care should be taken that the perpends are maintained correctly.

Arches.

We now arrive at the springing for the arches, which should be kept in a perfectly horizontal line. The centres are now fixed, and a watchful eye must be kept on the carpenter, or very likely it will be found that he has fixed them above the springing, or a trifle below, or else they are not quite level. If gauged arches are to be put in, great care must be taken in the setting-out, which should be entrusted only to a man who has had some experience of the work. It must be seen that the curve is struck from a proper point, also that all the bricks fit one to the other at extrados, intrados and face. If set in putty see that they are dipped so as to ensure a full joint on the face and soffit, and also a solid joint in the body of the brick, otherwise the weight superimposed on the arch will cause it to crack. The same remarks apply to rough-axed arches, only that it is best to joggle these, thus ensuring a solid body; rough arches, too, should always be joggled, that is, a small piece cut off the frog of the brick to form a channel into which cement-grout can be poured, finding its way all round the brick and ensuring a solid job.

A word as to

Chimney Flues.

See that these are well pargetted and free from all rough surfaces, for the slightest rough place where the smoke can hit will often cause a smoky chimney. Look also to the gatherings and see that they are cut in a proper manner—see there are no cripples. Take care that all the angles of the flues are smoothly rounded. Do not tolerate sharp corners or rough surfaces. After they have been built to the required height have them all very carefully cored with a set of drain rods. Where the chimney-breast passes between the thickness of the various floors it should be rendered on the outside ¾ in. thick with lime and hair mortar.

A few words as to

Glazed Work.

See that all the joints, both bed and cross-joints, are of an even thickness throughout, for nothing looks worse than one thick and two or three tight joints: not only is it a sign of bad workmanship, but where bricks are laid practically dry the arrises will frequently flush.

Finally, keep the whole of the building levelled up all round. Avoid toothings or indents, for they are frequently the cause of rupture—due, it is almost always said, to unequal settlement, but in most cases to the wall not being properly built at the intersection of the toothing or indent; nine times out of ten the joints, both bed and cross-joints, are not filled in solid, and often the proper bond (2½ ins.) is not left. Moreover, by keeping the building level over the whole site unequal settlement is avoided.

Bricks should be well damped, and compo mixed as used; none should be left overnight. Whenever a fresh scaffold is started have the wall well swept and damped before building, and in winter-time keep all walls carefully covered over till ready to work on them again.

Liverpool Dock Offices.—Referring to the article on this building in our issue for July 5th, a correspondent points out that the four corner towers are each 143ft. high, two of them being built in grey granite from ground to first floor. The description given implied that the two latter only were 143ft. high.

CONCRETE FENCE-POSTS.

IN a paper read by Mr. J. A. Mitchell before the Association of Cement-Users at Indianapolis, U.S.A., the following interesting particulars are given of the manufacture of concrete fence-posts. Both the dry and the wet (or slush) mixture may be used, but the former is the better. The proportion of cement to sand may be 1 to 3, 1 to 4 and even 1 to 5. Mr. Mitchell states that he tried 1 of sand to 1 of cement, but the result was an entire failure. It is almost impossible to make a good post without some form of reinforcement; and although wood has been tried, metal has been found to be the only really practicable material to use. Holes should not be put through the posts as a means of fastening the fence to them, as the holes weaken the posts and also take too long to make. Hooks and staples, and eyes made of wire embedded in the posts have been tried; but the best form of fastener is said to be one that fixes the fence and post rigidly together. There are various ways of doing this, depending on circumstances. For constructing the posts wooden moulds, being cheap, light and easily made, are the best. They should be collapsible, so that the post can be removed from them in twenty-four to forty-eight hours after making. These moulds, if cared for, will last several years.

Cost.

Posts made in the manner above described cost about 12 cents (about 6d.) each, the size being that required for ordinary railway fencing. This cost is based on the assumption that cement costs 1.50 dollars (6s. 3d.) per barrel, gravel 40 cents (1s. 8d.) per cub. yd., metal 2½ cents (1½d.) per lb., and labour 1.50 dollars (6s. 3d.) per day. Two men can make 175 to 200 posts per day. It is stated by Mr. Mitchell that these concrete posts will stand freezing without harm, and that hot weather has no injurious effect upon them. Mr. Mitchell says that he has been able, by making the posts tapered, to effect a very considerable saving in the quantity of concrete used, compared with the amount required for parallel posts of the same length and of the same size at the bottom as the parallel posts. Assuming the posts to be 6 ins. square, and allowing an area of iron reinforcement of 1 per cent. of the area of the cross-section of the post, the area of iron required would be 0.36 sq. in. If this reinforcement were arranged in the form of twelve rods, each ⅜ in. in diameter, it would represent closely the required area, and the rods could be placed four along each side at a depth of ¾ in. to 1 in. from the surface of the post.

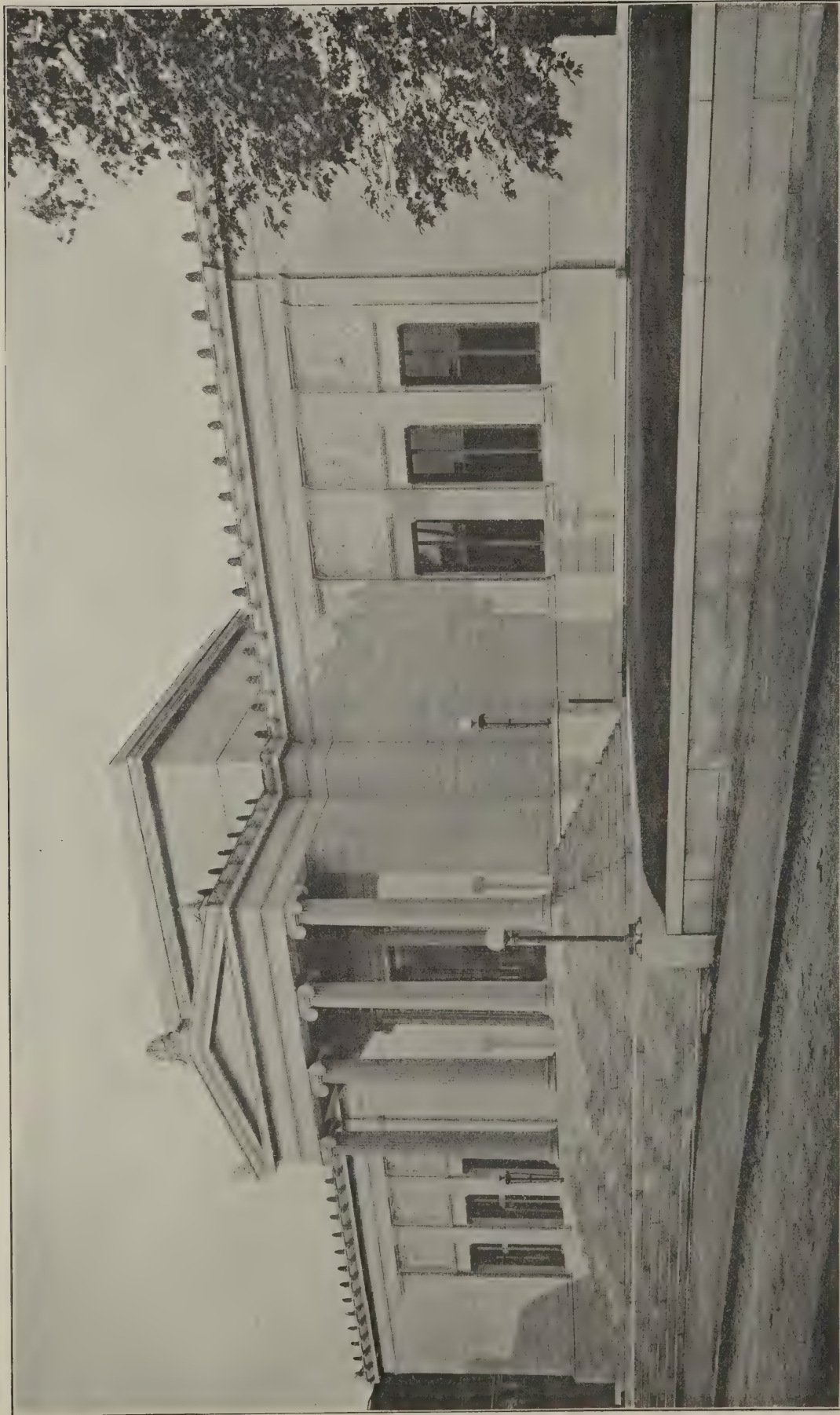
OUR PLATES.

THE libraries are among the finest buildings of the United States, and the example given in our plate is very typical of the style in which they are built. It will be seen that classic lines are closely followed and that a special effort is made to gain a monumental effect. Sculpture, too, is employed, as over the windows in this library at Pawtucket. The building masses up well, and is refined in feeling, as one would expect from such well-known architects as Messrs. Cram, Goodhue & Ferguson; but the strict following of Greek precedent in the employment of the antefixæ hardly produces a happy skyline for the cornice.

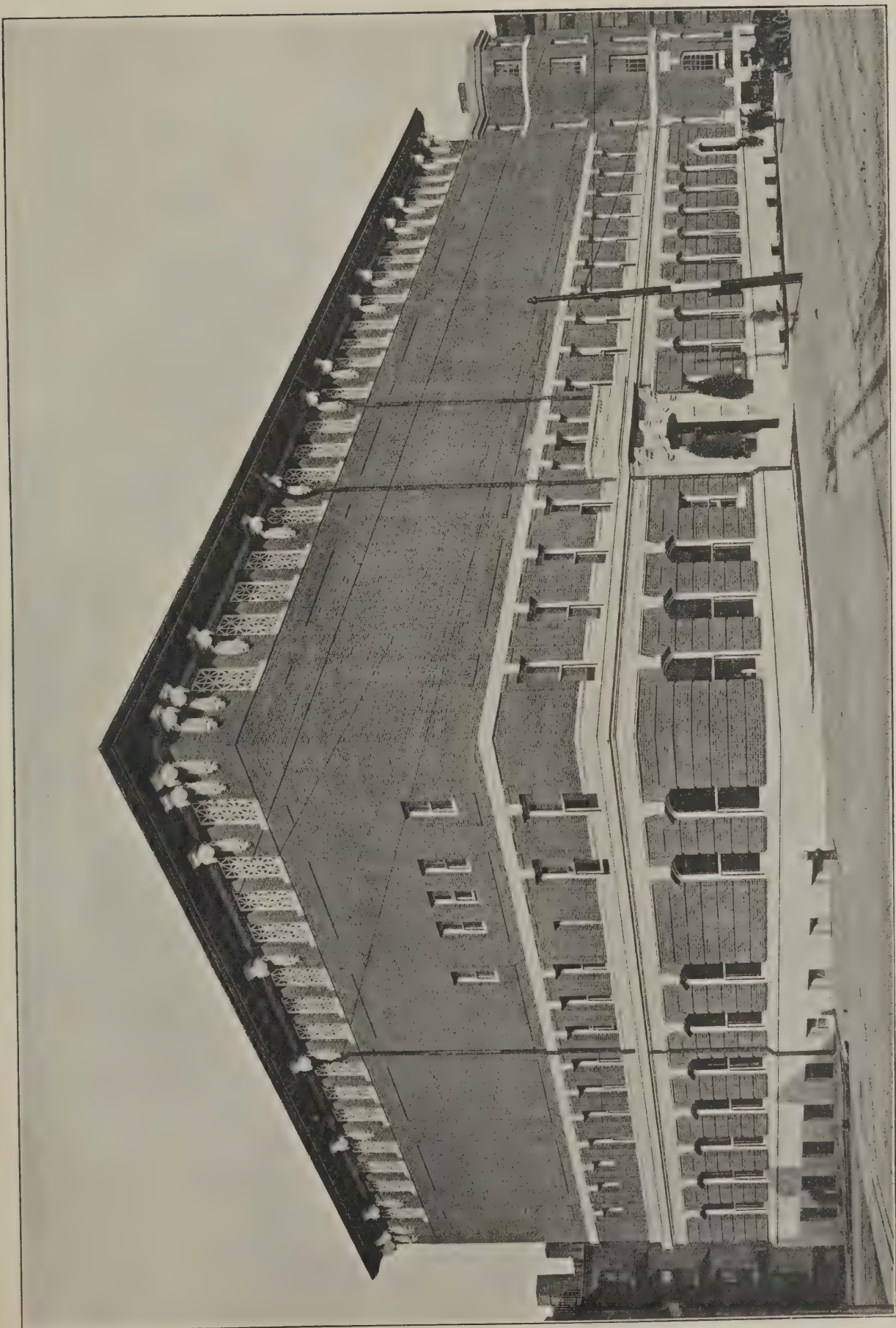
The tennis and racquet club at Boston is a good example of brickwork in America. The treatment was a difficult one, but the architects have been very successful in the arrangement of the unbroken wall-space, relieved by sunk panels in the brickwork and enlivened by the stone string-courses. The windows below the cornice are also a relief.

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, July 19th, 1905.



THE DEBORAH COOK SAYLES PUBLIC LIBRARY, PAWTUCKET, R.I., U.S.A. CRAM, GOODHUE & FERGUSON, ARCHITECTS.



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Correspondence.

A Suggested Improvement to the Marble Arch.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—While thanking you for the kind support given to this movement in your issue for July 5th, I desire to reply to one or two of the objections which you raise. First, you state that the appearance of the Marble Arch, coming through the Park, would not be greatly improved. I am well aware of this fact, but the only hope of my scheme being carried out was to suggest only such alterations as could be made at a nominal expense, and therefore I purposely refrained from attempting to interfere with the valuable property on the other side of Oxford Street. Secondly, you refer to a new processional road from Constitutional Hill and the Mall. I did not suggest this. The road through Hyde Park as already existing was what I referred to; its weakness, however, in present circumstances is that it has no dignified finish. Thirdly, you state, that "the plan for bringing a screen across Park Lane is also open to objection because it would force the main traffic road to be swung round sharply at the Oxford Street end, which is anything but desirable." May I point out, with reference to this remark, that the bulk of the traffic at present using Park Lane has to turn round on its way to and from Edgware Road at right angles at the Oxford Street corner. My plan would obviate this, and would enable the traffic going to Edgware Road to take a much easier turn. Fourthly, you are labouring under a misunderstanding with reference to the suggested Venetian mast lamp-posts. If you will refer to the "bird's-eye view," you will observe that the lamps are placed at the usual height of an electric standard, namely, 25ft.—the upper portion of the lamp-post being, in fact, a Venetian mast for the purpose of flying pendant flags on festive occasions.—Yours truly,

LONDON, W. F. W. SPEIGHT.

[(1) The expense of interfering with the property in Oxford Street was one of the reasons for our suggestion to move the Marble Arch in front of Edgware Road. (2) We used the word "new" to convey that the present road could not be considered a processional one. (3) In Mr. Speight's plan the traffic would be more directly delivered to Great Cumberland Place and Edgware Road, but if he will refer to a recent paper by Mr. John W. Simpson on "The Planning of Cities and Public Spaces" read before the Royal Institute of British Architects, and published in its "Journal," he will see that this gives more points of collision than the present arrangement. Mr. Speight's plan is also not convenient for the very considerable traffic to and from Oxford Street and Park Lane. (4) We raised an objection to the usual height electric street lamps are placed above the ground. We think the proper height should be about that of ordinary gas lamps, so as to afford better lighting, to prevent the dwarfing of surroundings, and to avoid a spidery proportion.—Ed. B.J.]

A Recreation Club for Architectural Students.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—It has often occurred to me that there is a lack of encouragement for recreation among architectural draughtsmen. Through your columns one might get in touch with most of the profession in London, and it might be possible to take soundings as to what the general opinion is as to an architectural club run on economical lines.—Yours truly,

W. GORDON.

91, RINGSTEAD ROAD, CATFORD.

[If we can be of any service to readers in this respect we shall be glad.—Ed. B.J.]

RESTORATIONS AND IMPROVEMENTS AT OXFORD.

IT is customary for the Oxford Architectural and Historical Society to place on record in their annual report any restorations or new building operations of importance that have taken place in the city. This year's report points out that the most striking of these improvements is the completion of the work at St. Michael's Church. The open space on the north side of the tower, obtained by pulling down the houses which formerly were built against it, has been laid out with shrubs, and a wrought-iron railing and gates have been erected to shut off the churchyard from the street, access being thus provided to the north door of the church. The old work has been carefully handled, and the whole constitutes an obvious improvement, which sets off the tower to great advantage.

Various alterations have been made at St. Ebbe's Church. The old upper storey of the tower has been repaired and the tower raised by the addition of another stage. Two windows have been inserted in the west wall of the nave and a western doorway formed underneath them by the opening of an arch formerly walled-up. The greater part of the remains of an old Norman doorway which stood outside the south wall of the church has been used to form this doorway, and a part of the old arch has been set up against the west wall of the church.

Work at the Colleges.

The new buildings at Merton College are rising rapidly, and the college also contemplates a new warden's house on the opposite side of Merton Street.

Magdalen College is building a block of houses in King Street opposite the quadrangle of the New Examination Schools, and the work is well advanced.

At New College the additions and improvements to the warden's house are now completed.

Mention must be made of the completion of the restoration work in the hall of University College. The old plaster ceiling is now a thing of the past. The hammer-beam roof discovered some time ago above it has been almost entirely renovated on the old lines and a new lantern added, in the centre. New oak panelling has been placed around the walls, a large carved oak chimney-piece has been added, and stained-glass inserted in the west and two of the side windows. These alterations, combined with the previous lengthening of the hall, have created a striking interior.

At Exeter College the old oak panelling in the hall, and also the fine oak screen, have been taken down, cleaned and restored to their place with slight alteration, and two new oak mantelpieces have been erected.

The Society's report mentions that the tomb of Thomas Hearne, the antiquary, is to be restored. The old stonework forming the base of the tomb will be re-set and the decayed parts renewed. A new inscription slab will be procured, similar in design to the old one (this latter being too far perished to be used again), and the old inscription cut on it. The old slab will be preserved.

Another Alpine Tunnel.—The French have been considering for a long time how they shall avert the losses with which they are threatened by the Simplon tunnel and its projected feeders. The French Minister of Public Works now proposes to lay a direct line from Lons-le-Launier, tunnelling the Col de la Faucille, and to continue this line under Mont-Blanc to Courmayeur, and thence down the valley to Aosta, whence it is easy to reach Turin, Milan, Piacenza and the overland route to Brindisi and the east. The estimated cost is 115,000,000 francs.

Keystones.

A Public Hall and Library at Hatton has been erected at a cost of £859. Mr. W. Davidson, of Ellon, was the architect.

The Shakespeare Memorial in London is to be an architectural one, including a statue. An open competition for the design is to be held.

Balavil House, Badenoch, Scotland, is being reconstructed under the direction of Messrs. McGibbon & Ross, 65, Frederick Street, Edinburgh.

The restoration of Old Abbey, Coupar Angus, is being carried out. For many years the ruins have lain covered up with earth and stones. Carved stones are now coming into view.

The Chancel and Morning Chapel of St. Peter's, Hornsey, have been completed. The building, which is from designs by the late Mr. James Brooks, cost, with the site and vicarage, £16,000.

Buckingham Parish Church has recently had two buttresses added to the tower. The rebuilding of the west door and the placing of five ornamental stone windows in the tower have also been carried out.

The Church of St. Catherine, Danzig, dating from the thirteenth century and one of the finest specimens of early Gothic in Germany, has been struck by lightning and completely burned down.

The Metropolitan and City Police Orphanage at Strawberry Hill has had a new wing added at a cost of £7,300. It includes a dormitory, dining-hall, gymnasium, band and art rooms, and kitchen, &c.

A Workmen's Club has been erected at Seaton Delaval at a cost of £4,000. The contract was carried out by Mr. N. Ritchie, of Whitley Bay, from the plans of Mr. J. T. Alexander, architect, of North Shields.

Yarrow Old Church is to be restored. It was built about the year 1640. Though the walls are sound the interior will require careful attention. The galleries are to be cleared out and an apse is to be constructed.

A Police-station and Court-house at Thorne has been erected at a cost of £2,000. The plans were prepared by Mr. Vickers Edwards, architect to the Yorkshire County Council, Wakefield, and the contractor was Mr. W. Barton, of Thorne.

Temporary Schools.—The Board of Education has agreed that in districts with a liability to subsidence, where the population depends on a fluctuating industry, and where small schools are desirable owing to a sparse population, buildings may be erected of galvanized iron, lined with boards and with a layer of felt between the outer and inner coverings.

The new Wesleyan Church and Schools at Saltburn have been completed. The buildings, which cost £7,000, are in the late Gothic style, the exterior being of stone from Pateley Bridge. The nave, aisles, chancel and organ-chamber, with pillars and arches, are in Whitby stone, and the roofs are covered with red tiles. Internally the whole of the woodwork is in pitch-pine. The contractors were Messrs. T. Dickinson & Son, of Saltburn and West Hartlepool, while the architects were Messrs. Garside & Pennington, of Castleford and Pontefract.

Lord Rosebery recently opened a loan exhibition of relics and treasures in the town hall, Aylesbury, organized for the purpose of celebrating the jubilee of the Bucks Architectural and Archaeological Society, of which he is president. The exhibits included mementos of well-known Buckinghamshire men and others, typical specimens of Bucks fauna, flora and geology, prehistoric and mediæval antiquities, old

silver and metal work (including church plate), examples of Bucks industries, pictures, and photographs.

Architectural Refinements.—The Edinburgh Town Council have given £10 to the autumn exhibition of the Edinburgh Architectural Association.

The North Bridge, Edinburgh.—At last it has been decided to place statuettes on the pedestals of the North Bridge, Edinburgh, which have remained vacant since the bridge was completed some years ago.

Rumoured Dangerous Condition of the Alhambra.—Reports from Granada speak of a threatened collapse at the Alhambra by reason of the undermining of the hill on which it stands by the rapid waters of the Darro. A proposal is on foot to divert the course of the river.

Vandalism in Greece.—The picturesque walls of Chalkis are being ruthlessly destroyed, and thus one of the most beautiful towns of Greece, and one of the few which has hitherto preserved its romantic mediæval appearance, is being reduced to a dull level of modern "culture."

A Dorsetshire Church.—The chancel and north transept, together with a temporary brick nave, of the new church of St. Osmund at Parkstone have been completed from designs by Mr. G. A. Bligh Livesay, F.R.I.B.A. The building is of terra-cotta, supplied by Messrs. Carter & Co., of Poole.

A Congress on Heating and Ventilation is being held this month at Hamburg. A special issue of the "Gesundheits-Ingenieur" gives a series of articles on certain of the more important branches of the science, among which is a very full account, with numerous illustrations, of the heating, ventilation and hot-water supply of the Grand Hotel at St. Moritz.

Edinburgh Architectural Association.—The annual excursion this year has been made at Dunkeld, where, after visiting the cathedral, the visitors inspected Murthly Castle, an unfinished Jacobean edifice of great size. Stobhall was afterwards visited, Mr. George T. Ewing, architect, acting as leader over this picturesque group of buildings, which consist of castle, chapel, priest's house and dowry house.

A new Chain-testing House at Cradley Heath has been erected by Messrs. Lloyds British Testing Co. at a cost of £20,000. The general block is a huge room 200ft. by 75ft. wide and 25ft. high, containing two machines—a tensile of 100 tons, and an anchor and breaking machine of 150 tons. The whole structure has been built by Messrs. J. & A. Brazier, of Bromsgrove, from Mr. Clarence A. Bloomer's designs.

The new Wards added to Newcastle Workhouse have been completed at a cost of £18,000. The accommodation is for 127 aged and infirm men and 153 aged and infirm women. The building work has been carried out by Mr. Thomas Weatheritt, the heating and engineering by Messrs. Emley & Sons, and the electric lighting by Mr. S. H. Gowdy—all of Newcastle. Messrs. Newcombe & Newcombe, of Newcastle, were the architects.

Alterations to St. Andrew's Halls, Glasgow.—It appears that these halls, the masterpiece of Sellars, are to be reconstructed internally, so as to increase the accommodation, at a cost of about £18,000. The plans have been prepared by, and are to be carried out under the superintendence of, the city engineer. Two large columns which interfered with the view of a few in the back gallery are to be removed, and the span bridged without support. The firm of the architect who designed the building (Messrs. Campbell Douglas & Sellars) have not been consulted in the matter.

The Restoration of Iona Cathedral has now advanced so far as to allow Divine service to be conducted in the choir.

Pontefract Workhouse has been extended at a cost of £15,000. Mr. A. Hartley, of Castleford, was the architect.

Durham Cathedral Organ has been thoroughly re-modelled by Messrs. Harrison & Harrison, organ builders, of Durham.

A Bronze Statue of Lord Tennyson, modelled by the late Mr. G. F. Watts, R.A., has been placed at the north-east corner of the Cathedral Green, Lincoln. The statue, which is 11ft. 8ins. high, stands on a marble pedestal.

Carnegie Library, Wombwell, Barnsley.—The architect of this building is Mr. A. B. Linford, of Wombwell, not Mr. H. L. Paterson, as stated on p. 21 of our issue for last week. Mr. Paterson was the assessor in the competition that was held.

Saltburn-by-the-Sea Wesleyan Church and Schools.—These buildings have just been completed, at a cost of over £7,000, from designs by Messrs. Garside & Pennington, architects, of Pontefract and Castleford. The church is divided into nave, aisles, chancel and organ-chamber, with pillars and arches in Whitby stone. Externally the stone is from Pateley Bridge, with hand-made red tiles on the roof. The contractors for the work were Messrs. T. Dickinson & Son, of Saltburn and West Hartlepool, the electric light having been installed by Messrs. Hind & Son, of Stockton, and the lead lights executed by Messrs. Stephenson, of Lancaster.

The old Gothic Church of Blythburgh, built in 1460, has for years past gradually become more and more dangerous through want of funds to keep the fine painted roof, the porch, &c., in proper repair. An influential committee has now been formed, under the immediate patronage of the Princess Louise, consisting of Sir Ralph Blois, Sir Caspar Purdon Clarke, Sir Ernest Waterloo, R.A., Mr. Seymour Lucas, R.A., Mr. Crofts, R.A., Mr. C. F. Egerton, the Bishop of Norwich, the Archdeacon of Suffolk, and others, and an art exhibition is to be held at Cockfield Hall on August 5th, when it is hoped to raise sufficient funds to preserve the work, for which the sum of £3,000 is needed.

Rebuilding a Goods Station.—The London and North-Western Railway Co. are now rebuilding their Haydon Square goods station, the work being in the hands of Messrs. Kirk & Randall. The basement is intended as a bonded store for wines and spirits. On the ground floor there will be loading decks at which it will be practicable to accommodate ninety lorries or carts, and by means of three lifts wagons may be conveyed from or to the rails on the viaduct level above, each lift to be capable of transferring wagons at the average rate of forty an hour. The rest of the ground floor will be roofed, for loading and unloading under cover. The building will be constructed of concrete. Patent glazing and steel bars encased with lead to prevent rusting will be used for the roofing, and stanchions and girders will be protected by fire-resisting material. The new station is designed to admit of the building above it of a warehouse of four floors with a total area of 18,500 sq. yds.

Dawpool School, Thurstaston, Cheshire, is being erected from designs by Mr. J. Francis Doyle, architect, of Liverpool. Accommodation will be provided for 104 scholars, with schoolmaster's house attached. The walls are faced externally in red bricks, with terra-cotta dressings and red-tiled roof. The whole of the school building has a deep dado of cream-glazed bricks, with plinth and band of light red, thus adding materially to the cleanliness and sanitary condition of the building.

At the Ruins of Linlithgow Palace lavatories are to be erected for the use of visitors.

A new Wesleyan Church at Ford, Devonport, is being built at an estimated cost of £5,600. The architect is Mr. H. J. Snell, of Plymouth, and the contractors are Messrs. A. R. Lethbridge & Son, also of Plymouth; Mr. R. Dark acting as clerk of the works.

Sheffield Society of Architects and Surveyors.—The eighteenth annual report, for 1904-5, gives the present membership as 120, while the accounts show a balance in the bank of £33. The report refers to the resolution of the council on July 15th last that it was desirable for each allied society to be represented every year on the council of the R.I.B.A., and states that in response to the request made for co-operation thirteen societies have expressed concurrence therewith. The matter will be brought before the R.I.B.A. for consideration.

New Sunday Schools, &c., for the Baptist Tabernacle, Southport, are being erected. The main schoolroom is 53ft. by 32ft. In addition there are twelve other classrooms, an infants' classroom 25ft. by 14ft., kitchen, large minister's vestry, lecture-hall 36ft. by 25ft., lavatory accommodation and library. Mr. Francis P. Halsall, A.R.I.B.A., of Southport, is the architect, and Messrs. Duxfield Brothers are the builders. The cost, exclusive of site, will be about £2,500. The elevations are being carried out in pressed bricks and grey terra-cotta from Mr. Jabez Thompson's works at Northwich.

Obituary.

Mr. William Dawson, builder, Macduff, died recently. Amongst the undertakings with which he was connected was the widening of Banff Bridge, about twenty years ago, the erection of the town hall and municipal buildings, and the contract for the Macduff sewage works.

Mr. C. F. Hayward, F.R.I.B.A., F.S.A., of Lingfield, died recently in his seventy-fifth year. He was district surveyor for Bloomsbury, Soho and Covent Garden. Among the buildings in London erected from his designs are Messrs. Lambert & Butler's tobacco factory in Drury Lane and Great Wild Street, and houses in Mayfair.

New Companies.

PROVANHALL BRICK CO., LTD., 95, Bath Street, Glasgow. Capital: £5,000.
GREAT NORTHERN CARTAGE CO., Tottenham Lane, Hornsey, N. Capital: £5,000.
GANN & CO., LTD., builders, contractors, &c., Tankerton Works, Whitstable, Kent. Capital: £10,000.
A. POLSUE-BURROW, LTD., painters, decorators, &c., Great Horton, Bradford. Capital: £2,000.
PYE PARINSON & CO., LTD., builders, contractors, &c. Capital: £1,200.
WEST LONDON PAPER-STAINING CO., LTD., West Ealing. Capital: £3,000.
BARGMAN, SON & CO., LTD., builders, contractors, &c., Fimlico. Capital: £4,000.
J. & G. DUXBURY, LTD., builders, contractors, &c., Padstow, Lancashire. Capital: £3,000.
JERRAM & CO., LTD., plumbers, glaziers, &c., Derby. Capital: £5,000.
STONE DAM ESTATE CO., LTD., builders, contractors, &c., Halifax, Bradford and Rcthwel. Capital: £1,000.
RAPIDAL PAINT CO., LTD., paint and varnish manufacturers, Wellington Road, East Ham. Capital: £2,000.
PETER FORD & SONS, LTD., manufacturers of plaster of Paris, cement, whitening, &c., Uttoxeter, Fould, Stanton, and Alton, Staffs.
BYWATER & SONS, LTD., builders, decorators, contractors, &c., 10 King Street, Regent Street, W. Capital: £50,000.
CROWN HILL BRICK AND TILE CO., LTD., to take over the business carried on by G. H. Tranfield at Shenley and Stantonbury, Bucks. Capital: £2,000.
GEORGE INGHAM MUIRHEAD CO., LTD., builders, timber merchants, engineers and general smiths, Newport and Madeley, Salop. Capital: £10,000.
DONALD BLACK AND CO., LTD., contractors and builders' merchants, Station Road, New Barnet, N. Capital: £5,000.
WILLIAM SHAW AND SONS, LTD., coal and lime merchants, Longwood and Gledholt and Scarwood-in-Golcar, near Huddersfield. Capital: £10,000.
LIVERPOOL HENNEBQUE FERRO-CONCRETE CONTRACTING CO., LTD., 22A, Slate Insurance Buildings, Street, Liverpool. Capital: £40,000.

THE ARRANGEMENT OF DRAWINGS.

By Alfred T. Best, A.M.I.C.E.

AS a plan may be made or marred by its arrangement, and beginners are often at a loss how to proceed, it is hoped that the following hints may be found useful.

Size of Paper.

Before commencing to plot or design take the over-all dimensions of what is to be drawn, determine a suitable scale, and find the over-all dimensions reduced to that scale. Thus, an estate 300yds. long, if the survey be plotted to a scale of 40ft. to 1in., will measure on the paper 22½ins. A bridge of 100ft. span to ¼in. scale, with approaches, will cover nearly 30ins., and its cross-section, say, 6ins.; total, 36ins. Add from 2ins. to 6ins. or 8ins. for margins, and this will give an approximate idea of the paper required. Take the nearest size in use, say a sheet of Imperial, 31 by 22, or Double Elephant, 40 by 27. Plans of this size should be rolled or stored flat. Smaller plans may be folded, to file with other documents, and for this reason should be made, say, of foolscap size (or quarto or any other standard unit) or multiples of it: thus, 12½ by 8, 16 by 12½, &c. If there are to be several drawings relating to the same work, endeavour to keep them uniform; avoid odd and irregular sizes.

Placing on Paper.

Find the centre of the paper by measurement or diagonals. From this centre mark off to left and right approximately one-half the over-all length. Similarly mark the top and bottom by taking one-half the over-all width or height, but measure from a point rather below the centre so as to leave for the title, &c., more margin above than below. But it generally happens that a drawing comprises several distinct parts, the different views necessary for complete illustration of the object being placed on a single sheet. If these component elements be numerous or complicated, it is a good plan to find their approximate sizes and to cut out of paper a rough outline of each part. Then by a little manipulation these can be disposed to the best advantage and the various drawings placed on the paper accordingly. But as a rule this can be done easily enough by mental calculation, or at most with the aid of a rough dimensioned sketch first jotted down on scrap paper. Unless some preliminary thought be given to these questions the result may be a plan looking ridiculously small and lost in the corner of an acre of blank; or, on the other hand, the plan when half plotted may be found to "walk off" the paper on to the drawing board. This is much more vexatious; therefore err on the side of excess of space; paper is cheap and "time is money." For machine drawings, symmetrical architecture, &c., commence with centre lines.

Projection.

The correct principles of projection are very commonly disregarded, which is much to be regretted, for the result of such neglect is a great loss of clearness. Fig. 1 shows a drawing which is faulty in this respect, as an example of how not to do it. Here the plan and section are placed without any relation to one another, and the section has to be mentally twisted round to bring it into relation with the plan. The plan should be placed under the section or elevation, and should face the same way, so that vertical lines connect point to point. If the plan be drawn first, lines are projected from it to form a basis for the elevation; then from the elevation lines are run horizontally to an end elevation or section. In order to get a rational idea of what is right and why it should be so, if the obvious extra facility in designing and understanding the drawing be not sufficient proof, fold (or imagine) a sheet of paper forming three sides of a box,

inside which stands the article or building to be drawn, or a model of it. Take, for example, as shown by Fig. 2, a very simple object like a common brick (the principles are the same whether applied to a palace or a drain pipe); then vertical lines dropped down to the horizontal plane mark out the plan; horizontal lines carried back to the vertical plane show the front elevation; horizontal lines at right angles to these last, carried along to the other vertical plane,

show the end elevation. Removing the brick or other model, real or imaginary, and "developing" (unfolding) the paper, it appears as in Fig. 3, or, by an alternative development, as in Fig. 4. Or consider the paper to be transparent and folded to lie horizontally over and vertically in front of the object, as in Fig. 5. By vertical and horizontal rays mark out the plan as seen from above, the elevation as seen from in front, &c. The paper unfolded is as Fig. 6.

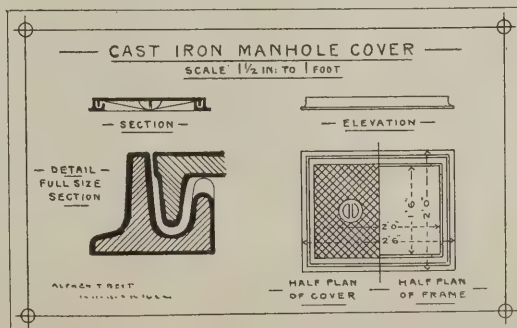
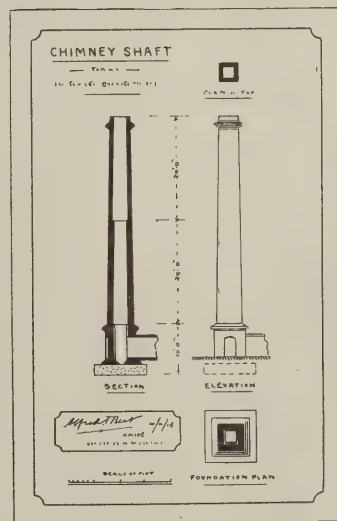
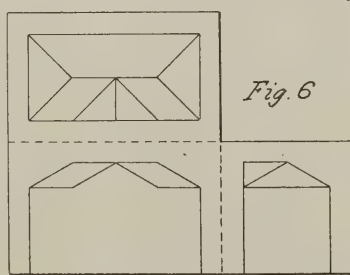
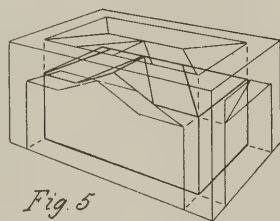
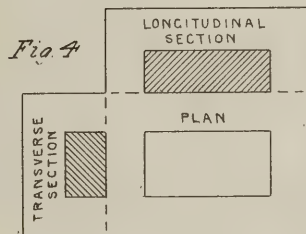
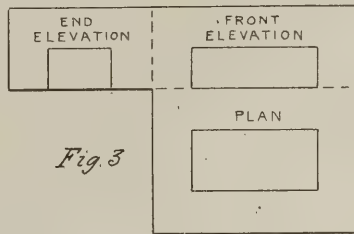
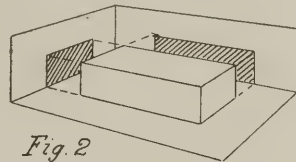
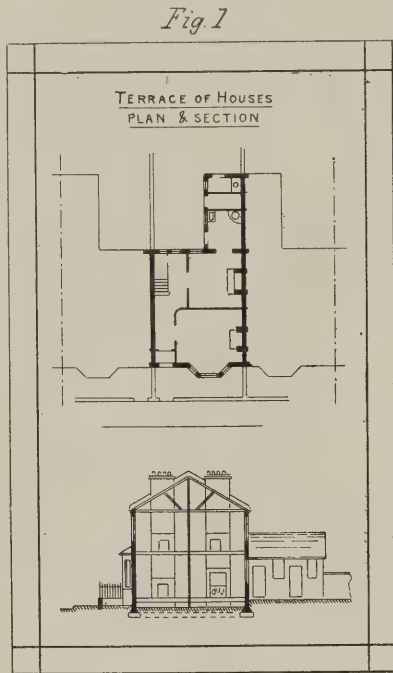


FIG. 1.—FAULTY ARRANGEMENT. FIGS. 2, 3, AND 4.—VIEWS OF A BRICK, OBTAINED BY PROJECTION. FIGS. 5 AND 6.—ALTERNATIVE METHOD OF PROJECTION. FIGS. 7 AND 8.—SPECIMEN DRAWINGS PROPERLY ARRANGED.

Electrical Notes.

Electro-technical Laboratories.

New electro-technical laboratories at Liverpool University have been built at a cost of £12,000 from designs by Messrs. Willink & Thicknesse, the builders being Messrs. William Thornton & Sons, and the electrical fittings having been supplied by Messrs. John Hunter & Co., all of Liverpool. The basement is occupied by rooms intended for experiments with heavy machinery, and by rooms set apart for electrical measurements of various kinds and for purposes of research. The dynamo-room is 56ft. by 60ft. and is divided into three bays, one intended for testing direct-current machinery and one for work with alternating currents, while the third contains a two-cylinder Westinghouse gas-engine coupled to a dynamo which can be used for lighting the whole block of the new buildings, and also a tramcar body with complete electrical equipment. There are, in addition, dynamos and motors of various types, and several machines lent for experimental work, the owners of which are supplied with the results obtained. Adjacent is a workshop fitted with electrically-driven tools, and a senior students' laboratory 34ft. by 28ft., equipped for alternating-current testing. The laboratories in the front of the basement include one measuring 35ft. by 13ft., fitted with appliances for producing high electrical pressures by which "break-down" tests on insulating materials, such as are used in the manufacture of high-tension cables, may be carried out; another containing apparatus for investigating the magnetic qualities of iron and steel; and a third provided with a photometric bench. Two large rooms, 20ft. by 27ft., are intended for general research; one at present contains a high-frequency

oscillograph, but the other, to be devoted to electro-chemical work, is as yet without equipment. The same lack of equipment is apparent, though in a less degree, in four other rooms, of which one contains accumulators for research work only, another being intended for "life" tests on electric lamps, the third for testing meters, and the fourth to hold standard instruments, which will be regularly compared with the standards at the National Physical Laboratory. On the ground floor are arranged laboratories for less advanced work, together with a professor's room and private research laboratory, while on the first floor there is a lecture-room with seats for 130 students, the table of which can be connected with any machine in the dynamo-room, together with smaller class and demonstration rooms and a reading-room and library.

Electric Power for Scotch Factories.

The Clyde Valley Electrical Power Co. of Glasgow have opened a power station at Yoker, near Glasgow, to supply electrical energy at the lowest rates for manufacturing purposes. The area which it can now deal with covers 750 miles, and contains the chief centres of iron, steel and coal production, and the Clyde shipbuilding yards. The company's plant will be available night and day, and as it can furnish power at a price which would be impossible for any private installation to attain, it will open up great possibilities for trade extension in the Clyde valley, and will, it is hoped, enable the smaller home manufacturers to compete the better with foreign rivals.

A Sample Cabinet.

The Simplex Steel Conduit Co., Ltd., of Westinghouse Building, Norfolk Street, Strand, London, W.C., send us particulars of a novel sample cabinet which they have prepared with the idea of supplying on loan to station engineers, architects, lecturers, &c., a

set of samples of their various conduits and fittings. There are four trays, so that the samples can be classified into main groups, and as each tray is subdivided the groups can be further arranged in sections.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending July 14th twenty-two failures in the building and timber trades in England and Wales were gazetted.

S. SMITH, plumber, Mansfield. R.O. July 4th.
R. STEWART, builder, Hatfield Woodhouse. R.O. July 6th.

J. JONES, carpenter, Dowlais. R.O. July 4th. P.E., Merthyr Tydfil Town Hall, July 26th, at 3.

W. N. RICHARDSON, painter, decorator, &c., Leire. P.E., the Castle, Leicester, Aug. 1st, at 10.

W. S. GOODSON, builder and joiner, Eastcote, near Pinner. Adj. July 5th.

F. HODGES, builder, Isleworth and Ealing. R.O. July 7th.

W. J. MORSE, varnish manufacturer, Shoreditch. P.E., London Bankruptcy Court, Aug. 4th, at 12.

A. BRUSH, builder, Woodford Green (late Chigwell). P.E., London Bankruptcy Court, Aug. 9th, at 11.

J. CAMPBELL CREE, builder, late of East Ham. Adj. July 14th.

WITT BROTHERS, builders, Bitterne. R.O. July 8th. First meeting, O.R.'s, Southampton, July 19th, at 3.30. P.E., Southampton C.C., July 26th, at 12.

T. ROGERS, plumbers' and painters' merchants, Urmston and Manchester. First meeting, O.R.'s, Manchester, July 19th, at 3.30. P.E., Manchester C.C., Aug. 21st, at 10.

W. BELCHER, brick merchant, Bayswater Road, London, W. Gross liabilities £57,010; £7,306 unsecured; estimated surplus in assets £918.

W. THEOBALDS, architect and surveyor, 26, Budge Row, E.C. P.E., London Bankruptcy Court, Aug. 8th, at 11.

W. LEE, builder, Ashford (late Kenley). R.O. July 4th. First meeting, 24, Railway Approach, London Bridge, July 21st, at 11.30. P.E., Croydon C.C., Aug. 16th, at 11.

J. THOMSON, builder, Leeds. R.O. July 5th. First meeting, O.R.'s, Leeds, July 19th, at 12. P.E., Leeds C.C., July 31st, at 11.

P. G. WALLER, builders' ironmonger, Pontefract and Purston. R.O. July 6th. First meeting, O.R.'s Wakefield, July 19th, at 11. P.E., Wakefield C.C., Aug. 3rd, at 11.

The Edison & Swan United Electric Light Company, Limited,

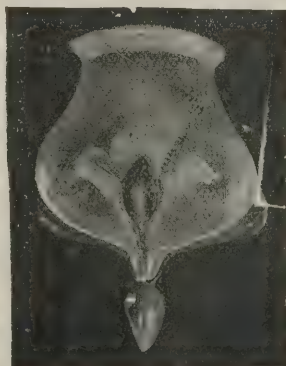
36 & 37, QUEEN STREET, CHEAPSIDE, LONDON, E.C.

And at Birmingham, Belfast, Dublin, Cardiff, Dundee, Glasgow, Hull, Leeds, Liverpool, Manchester, Newcastle-on-Tyne, Sydney, N.S.W.



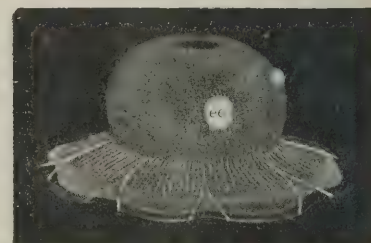
G. 3756.

Yellow Opalescent or Flint with Green Blobs, Satin Finish and finely Etched.



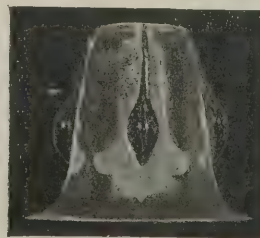
G. 3561.

Yellow Opalescent or Flint with Green Blobs, Satin Finish and finely Etched.



G. 3781.

Yellow and Pink Opalescent or Flint Finish.



G. 3771.

Yellow Opalescent or Flint, with Green Blobs, Satin Finish and finely Etched.



G. 3766.

Yellow Opalescent or Flint, Satin Finish, finely Etched and Cut.

A SPECIALITY:

"Ediswan"
Shades for . . .
Electric Light Fittings.

others of more delicate workmanship. This monastery contains a fine bell tower of the Romanesque style and a few portions of Renaissance work. Jumilhac-le-Grand possesses a château with a beautiful chapel. St. Jean de Cole and Bussières-Dadil both contain good churches. At Angoulême the domed cathedral is one of the best examples of French Romanesque work. In the vicinity of Angoulême are the churches of Trois Palis and Bassac, and the magnificent château de la Rochefoucauld. Proceeding from Angoulême in the direction of Bordeaux, the towns of Plassac, Montheiers and Chalais, which possess fine churches, should be visited. At Charmaute is a fine priory and at La Couronne are the ruins of a splendid Gothic abbey. When at Angoulême, if time permits, a trip should be taken to Saintes and Cognac, both of which places are full of splendid examples of architecture of all periods.

H. M.

Board of Education Examination in Architecture.

SIDMOUTH, DEVON.—DOWN SOUTH writes: "Please inform me what the word 'architecture' embodies in the South Kensington examinations, stage III. (Building Construction). In this year's papers the instructions before the questions in the honours paper state: 'No candidate will be credited with a success in this examination who has not obtained a previous success in stage III. or honours of the same subject, and who does not qualify in the Board's examination in architecture.' In previous years the examination in the history of architecture was taken in the honours paper, and the final was an examination in design. Are these two subjects now combined? Can you tell me in what month the final examination is held?"

The syllabus in architecture is published in the Board of Education "Syllabuses and Lists of Apparatus applicable to Schools and Classes other than Elementary," p. 198. The sections are: (1) Influence of materials, &c., study of details; (2) the Greek and Roman Orders; (3) Influence of constructive necessity in developing later styles; (4) characteristics of English architecture; (5) description of buildings; (6) terms in ordinary use. The examination for this is distinct from the examination in building construction. The honours examination in practical designing is still continued, and the notices have already gone out for this year to those candidates who are eligible.

HENRY ADAMS.

The Architectural Societies.

HORLEY.—B. S. writes: "Is there any way of becoming a member of any architectural society without taking the preliminary examinations if the applicant is in a practice

as an architect and therefore has not time to give to them?"

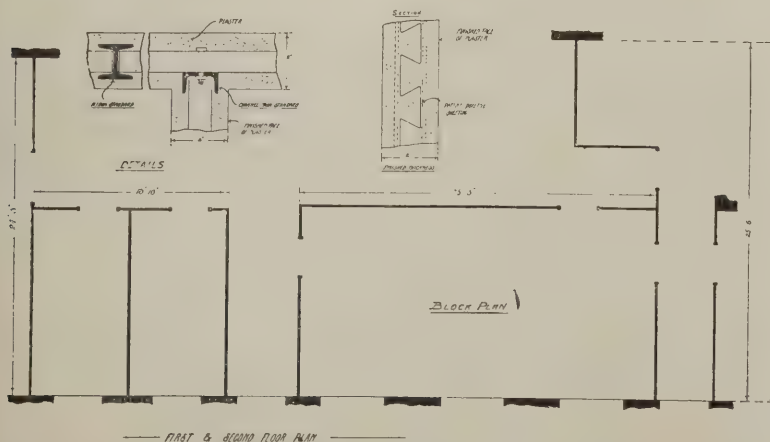
None that give degrees. You can join the Architectural Association without passing an examination.

Buildings to Measure near Barrow and Harrogate.

Referring to the replies as to buildings to measure near Barrow and Harrogate in our issue for last week, Mr. H. E. Illingworth, A.R.I.B.A., of Leeds, writes: "With regard to Barrow, Furness Abbey is certainly worth a visit and careful study, but the red sandstone of which it is built is not very well preserved, and it would not be very easy to get the exact mouldings. Far more suitable for your correspondent is Cartmel Priory (Grange station). (Tickets almost always allow a break of the journey here, as well as Furness Abbey.) It contains all styles from Transitional Norman; the east window (Perpendicular) is one of the finest in England; inside the building are very fine choir stalls well worth measuring, and good subjects in stone, very well preserved, of any period of Gothic. Cheap day tickets to Cark or Grange stations (about the same distance) may be obtained from Barrow. The query with regard to Harrogate is rather misleading. Ilkley contains nothing worth measuring; Bolton Abbey (6 miles) is, however, full of subjects, but very often done by local students, especially portions of the Early English west front. Contrary to your reply, I should advise Harrogate as a centre, visiting Ripon, for the Minster (11 miles), Fountains Abbey—motor bus from Ripon or a pleasant country walk of 2½ miles from Wormald Green station (return rod. from Harrogate), and not on any account missing Markenfield Hall, a slight detour from the last-named route, a moated hall of Edward III. period, and Fountains Hall, close to the abbey, one of the finest things in Yorkshire (Jacobean). York is only 20 miles from Harrogate by coach or direct railway; Masham (fine church) same distance. Small churches within a radius of 4 miles of Harrogate are Knaresbro', Ripley (also castle), Kirkby Overblow, and Goldsborough. These are principally Perpendicular, but are worth a visit."

FIRE-RESISTING PARTITIONS.

THE accompanying illustration shows the fireproof partitions carried out at the "Underground" generating station at Chelsea by the Fireproof Co., Ltd., of Waldo House, York Buildings, Adelphi, W.C. The partitions are finished zinc, thick and are fire-, sound-, damp- and vermin-proof. The construction is clearly shown by the illustration and needs no description.



FIRE-RESISTING PARTITIONS AT THE "UNDERGROUND" GENERATING STATION AT CHELSEA, CONSTRUCTED BY THE FIREPROOF CO. LTD.

Coming Events.

Wednesday, July 19.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Excursion meeting at Darlington to inspect the Barton and Forcett mountain limestone quarries.

INSTITUTE OF SANITARY ENGINEERS.—Examination and Literary Committee at 3.30 p.m. Finance Committee at 5 p.m.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Half-yearly Meeting of Members at 8 p.m.

July 19 to 25.

ROYAL INSTITUTE OF PUBLIC HEALTH.—London Congress, President's inaugural address at His Majesty's Theatre to-day (Wednesday), at 3 p.m.

Saturday, July 22.

NORTHERN ARCHITECTURAL ASSOCIATION.—Annual excursion to Barnard Castle and Raby Castle.

Tuesday, July 25.

JUNIOR INSTITUTION OF ENGINEERS.—Visit to new Vauxhall Bridge works at 6.30 p.m.

Saturday to Monday, July 29-31.

INSTITUTE OF SANITARY ENGINEERS.—Summer Outing, to Southampton.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	... ..	per qr.	1	10	0	1	13
Clover, best	... ..	per load	3	15	0	4	2
Hay, good	... ..	do.	3	10	0	3	15
Sainfoin mixture	... ..	do.	3	10	0	3	17
Straw	... ..	do.	1	12	0	2	0

OILS AND PAINTS.

Castor Oil, French	... ..	per cwt.	1	0	5	—
Colza Oil, English	... ..	do.	1	3	0	—
Copperas	... ..	per ton	2	0	0	—
Lard Oil	... ..	per cwt.	2	15	0	2
Lead, white, ground, carbamate	... ..	per ton	16	0	0	—
Do. red	... ..	do.	15	0	0	—
Linseed Oil, barrels	... ..	per cwt.	0	19	9	—
Petroleum, American	... ..	per gal.	0	0	58	0
Do. Russian	... ..	do.	0	0	5	0
Pitch	... ..	per barrel	0	8	0	—
Shellac, orange	... ..	per cwt.	7	12	6	—
Soda, crystals	... ..	per ton	3	2	6	3
Tallow, Town	... ..	per cwt.	1	4	0	—
Tar, Stockholm	... ..	per barrel	1	6	6	—
Turpentine	... ..	per cwt.	2	3	9	—

METALS.

Copper, sheet, strong	... ..	per ton	80	0	0	—
Iron, Staffs., bar	... ..	do.	5	12	6	8
Do. Galvanized Corrugated sheet	... ..	do.	10	15	0	—
Lead, pig, Soft Foreign	... ..	do.	13	15	0	14
Do. do. English common brands	... ..	do.	13	16	3	—
Do. sheet English, 3lb. persq. ft. and upwards	... ..	do.	14	0	0	—
Do. pipe	... ..	do.	15	0	0	—
Nails, cut clasp, 3in. to 6in.	... ..	do.	9	5	0	—
Do. floor brads	... ..	do.	9	0	0	—
Steel, Staffs., Girders and Angles	... ..	do.	5	7	6	5
Do. do. Mild bars	... ..	do.	6	0	0	6
Tin, Foreign	... ..	do.	144	2	6	144
Do. English ingots	... ..	do.	140	15	0	142
Zinc, sheets, Silesian	... ..	do.	26	15	0	—
Do. do. Vieille Montaigne	... ..	do.	27	0	0	—
Do. Spelter	... ..	do.	24	2	6	24

TIMBER.

Soft Woods.

Fir, Dantzic and Memel	... ..	per load	2	15	0	5
Pine, Quebec, Yellow	... ..	do.	4	0	0	7
Do. Pitch, American	... ..	do.	3	0	0	5
Laths, log, Dantzic	... ..	per cu. fath.	4	0	0	6
Deals, St. Petersburg, Yellow, 1st, 3x9	... ..	do.	9	15	0	—
Do. do. do. Unsorted, 3x10	... ..	do.	8	5	0	—
Do. do. do. 2½x8	... ..	do.	8	5	0	—
Do. do. do. White, Unsorted, 3x9	... ..	do.	8	5	0	—
Do. do. do. 3x8	... ..	do.	8	0	0	—
Do. Kem Yellow, 2nd, 3x9	... ..	do.	12	5	0	—
Do. Kem, (White Sea), Yellow, 3rd, 3x9	... ..	do.	9	10	0	—
Do. Blankaholm, Yellow, 2nd, 3x8	... ..	do.	8	15	0	—
Do. Sandarne, Yellow, 3rd, 3x8	... ..	do.	9	15	0	—
Battens, all kinds	... ..	do.	0	10	0	11
Flooring Boards in. prepared, 1st...	... ..	per square	0	10	3	0
Do. 2nd	... ..	do.	0	10	0	—
Do. 3rd, &c.	... ..	do.	0	7	3	—

HARD WOODS.

Ash, Quebec	... ..	per load	3	17	6	7
Birch, New Brunswick	... ..	do.	2	5	0	4
Do. Quebec do.	... ..	do.	2	10	0	5
Box, Turkey	... ..	per ton	7	0	0	20
Cedar, Cuba	... ..	per ft. sup.	0	0	3½	0
Do. Honduras	... ..	do.	0	0	3½	—
Do. Tobasco	... ..	do.	0	0	5	—
Elm, Quebec	... ..	per load	4	0	0	8
Jarrah, planks	... ..	per ft. cu.	0	2	6	0
Mahogany, Average Price for Cargo, Honduras	... ..	per ft. sup.	0	0	3½	—
Do. Tobasco	... ..	do.	0	0	5½	—
Do. Cuba	... ..	do.	0	0	2½	—
Do. African	... ..	do.	0	0	3½	—
Oak, Wainscot	... ..	per log.	3	0	0	6
Teak, Indian, logs	... ..	per load	10	0	0	19

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:				
July	20	Heywood—School	Education Authority	J. E. Mills, Market Place, Heywood.
"	20	Keighley—School	—	Moore & Crabtree, York Chambers, Crabtree.
"	20	Langley Park, co. Durham—Two Houses	Conssett Iron Co.	C. E. Oliver, General Offices, Crabtree.
"	20	Wyke, Bradford—Shops, &c.	—	W. Wilcox & Son, 9 Leeds Road, Bradford.
"	20	Portmadoc—Chapel	—	M. Williams, Fron, Dolwyddelan.
"	21	Nantymoel—Additions to Institute, &c.	Committee	J. M. Williams, Architect, Blackmill.
"	21	Weardale—Organ-chamber	—	W. Brown, St. John's Chapel, R.S.O., co. Durham.
"	22	Sheffield—Cottages	Corporation	Charles F. Wike, City Surveyor, Town Hall, Sheffield.
"	22	Penge, S.E.—Depôt Buildings	Urban District Council	H. W. Longdin, Town Hall, Anerley, S.E.
"	22	Winsford—Bakery	Industrial Co-op. Society	Company's Office, 21 High Street, Winsford.
"	22	Newport, Isle of Wight—Alterations, &c., to School	Education Committee	County Education Offices, Newport, Isle of Wight.
"	22	Londonderry—Rebuilding of Premises... ..	—	J. P. McGrath, Commercial Building, Foyle Street, Londonderry.
"	22	Ancroft—Repairs to School	—	H. A. Peters, Register Office, Berwick.
"	22	Bingley—Two Schools, &c.	Education Committee	Education Offices, Bingley.
"	22	Halifax—Two Houses	—	T. Kershaw, Bank Chambers, Halifax.
"	22	Romansleigh, Devon—Restoration Work	—	Rector, Romansleigh.
"	22	Newmarket—Alterations at Police-station	Standing Joint Committee	A. A. Hunt, County Architect, Bury St. Edmunds.
"	24	Hereford—School	Education Authority	J. Parker, Town Hall, Hereford.
"	24	Brookwood, Surrey—School	Education Authority	Jarvis & Richards, 36 Victoria Street, S.W.
"	24	Porth—Additions to Miners' Office	Rhondda Miners' Federation	R. L. Griffiths, Architect and Surveyor, Tontypandy.
"	24	St. Dogmell's, near Cardigan—Additions to School	Education Authority	Head Teacher, Council School, St. Dogmell's.
"	24	Beckenham—Extension of Boiler-house, &c.	Urban District Council	J. A. Angell, Surveyor, Beckenham.
"	24	Wrexham—Infirmary	Guardians	G. Morrison, King Street, Wrexham.
"	24	Tottenham—Repairs to Schools	Education Committee	W. H. Prescott, 712 High Road, Tottenham.
"	25	London, S.W.—Block of Dwellings	London County Council	Housing Section of Architect's Department, 19 Charing Cross Rd., W.C.
"	25	West Ham—Tramway Office, &c.	County Borough	J. G. Morley, Town Hall, West Ham.
"	25	Sevenoaks—Alterations at Union Infirmary	Guardians	B. Knight, Master of Union Workhouse, Sundridge.
"	25	Aston, Birmingham—Pavilion	Guardians	C. Whitwell & Son, 23 Temple Row, Birmingham.
"	25	Glasgow—Baths, &c.	Corporation	A. B. M'Donald, 64 Cochrane Street, Glasgow.
"	25	Poole, Dorset—Laundry, &c.	Guardians	H. F. J. Barnes, Towngate Street, Poole.
"	26	Rhymney—Alterations, &c., to Chapel... ..	—	Chapel House, Brynhyfryd, Rhymney.
"	26	Blackburn—Fire-station	Corporation	Briggs & Wolstenholme, Richmond Terrace, Blackburn.
"	26	Burntisland—Extension of Municipal Buildings	Council	Borough Surveyor, Town Hall, Burntisland.
"	26	Nelson—School	Education Committee	T. Bell, Grimshaw Street, Burnley.
"	27	Prestwich—Wall	Guardians	T. Worthington & Son, 66 Brown Street, Prestwich.
"	28	Birmingham—Depôt	Corporation	Harris & Harris, 9 Bennett's Hill, Birmingham.
"	28	Pontypool—Chapel	Urban District Council	D. J. Lougher, Bank Chambers, Pontypool.
"	28	Walsall—School	Education Committee	Bailey & McConall, Bridge Street, Walsall.
"	29	Lincoln—School	Governors	E. C. Pinks, Parliament Mansions, Victoria Street, S.W.
"	29	Rathfriland—Renovation of Church	Industrial Co-op. Society	D. Murphy, Newry Street, Rathfriland.
"	29	Widnes—Premises	Council	Society's Offices, 406 Church Street, Runcorn.
"	31	Stepney, E.—Extension of Library	Guardians	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
"	31	Emsvale, Monaghan—Dispensary	—	W. A. Scott, 74 Holly Bank Road, Drumcondra.
Aug.	1	Ballymoney—Technical School	Governors	J. A. Hanna, Ocean Building, Belfast.
"	1	Buckingham—New Royal Latin School	Education Committee	Town Hall, Buckingham.
"	1	Carlisle—School Buildings	Education Committee	A. H. Collingwood, 15 Fisher Street, Carlisle.
"	5	Sheffield—School	—	Secretary, Education Committee, Education Offices, Sheffield.
No date		Chesterfield—Church and Schools	—	W. C. Jackson, 29 Knivesmith Gate, Chesterfield.
ENGINEERING:				
July	20	Hollingbourn, Kent—Waterworks	Guardians	J. H. Bracher, 33 Earl Street, Maidstone.
"	21	Clydebank, N.B.—Sewer	Town Council	G. Ross, Borough Surveyor, Clydebank.
"	21	Pentre, Glam.—Gasholder	Urban District Council	O. Thomas, Gas and Water Offices, Pentre.
"	21	West Hartlepool—Outlet Extension	Corporation	N. F. Dennis, Municipal Buildings, West Hartlepool.
"	22	Scallaway, Shetland—Water-supply	—	Jenkins & Marr, 16 Bridge Street, Aberdeen.
"	22	Halstead—Gas Engine	Urban District Council	W. A. Nicholson, Surveyor's Office, Halstead.
"	24	Esk—Steelwork	Caledonian Railway Co.	Office of Co.'s District Engineer, Princes Street Station, Edinburgh.
"	24	Hexham—Outfall Works	Rural District Council	I. E. Parker, Post Office Chambers, Newcastle-on-Tyne.
"	24	Antwerp—Heating Apparatus	Commercial Intelligence Branch of Board of Trade	Hotel de Ville, Antwerp.
"	25	Dublin—Locomotives	Cleaning Committee	S. Harty, City Hall, Dublin.
"	25	Dartford—Storage Tank	Metropolitan Asylums Board	Office of Board, Embankment, E.C.
"	26	West Hartlepool—Iron Covering	Corporation	N. F. Dennis, Municipal Buildings, West Hartlepool.
"	26	Malvern—Rising Main	Urban District Council	W. O. Thorp, Surveyor and Waterworks Engineer, Malvern.
"	28	Chelmsford—Laying Pipes	Rural District Council	J. Dewhurst, Avenue Chambers, Chelmsford.
"	28	Hull—Supply and Fixing of Constructional Steelwork	Corporation	City Architect, Town Hall, Hull.
"	29	Lydbrook—Culvert	Education Committee	M. H. Medland, 15 Clarence Street, Gloucester.
Aug.	1	Waterford—Railway Station	Great S. & W. Ry. Co., Ltd.	Office of Company's Engineer, Inchicore, Dublin.
"	2	Cardiff—Sewers	Corporation	W. Harper, Borough Engineer, Cardiff.
Sept.	1	Merthyr Tydfil—Destructor Plant	Urban District Council	T. F. Harvey, Town Hall, Merthyr.
"	1	Wolverhampton—Pumping Engine	Corporation	E. A. B. Woodward, Town Hall, Wolverhampton.
IRON AND STEEL:				
July	21	Valetta—Manhole Covers, &c.	Harbour Commissioners	Crown Agents for Colonies, Whitehall Gardens, S.W.
"	21	Whitehaven—Ironmongery	Town Council	J. Tipon, Harbour Office, Queen's Dock Quay, Whitehaven.
"	22	Conway—Cast-iron Mains, &c.	Urban District Council	Borough Surveyor, Town Hall, Conway.
"	25	Exmouth—Pipes	Gas Committee	S. Hutton, Public Hall Chambers, Exmouth.
"	27	Belfast—Castings	Isthmian Canal Commission	Gasworks, Belfast.
"	29	Washington, U.S.A.—Copper Wire, &c.	Urban District Council	General Purchasing Officer, Washington.
"	31	Sevenoaks—Iron Fencing	Corporation	S. Towson, Surveyor, Sevenoaks.
Aug.	15	Callao—Piping	—	Graham, Rowse & Co., Mersey Chambers, Liverpool.
PAINTING AND PLUMBING:				
July	20	Cork—Redecorating Interior of Church	Dane John Committee	S. F. Hynes, 21 South Mall, Cork.
"	20	Canterbury—Painting Work in Gardens	Watch Committee	A. C. Turley, Guildhall Street, Canterbury.
"	21	Stockport—Interior and Exterior Painting	—	J. Atkinson, Borough Surveyor, Stockport.
"	21	Watermillock—Painting at Schools	Town Council	Rector, Watermillock.
"	21	Richmond, Surrey—Painting at Workmen's Dwellings	Harbour Commissioners	J. H. Brierley, Town Hall, Richmond.
"	21	Whitehaven—Oils and Paints	Education Committee	J. Tipon, Harbour Office, Queen's Dock Quay, Whitehaven.
"	22	Derby—Painting, &c., at Schools	Town Council	W. Cooper, Education Offices, Becket Street, Derby.
"	22	Conway—Oils, &c.	—	Borough Surveyor, Town Hall, Conway.
"	25	Leeds—Painting, &c., Rooms	Guardians	City Engineer's Office, Leeds.
"	31	Samford—Painting Exterior of Workhouse	Corporation	Clerk, Workhouse, Samford.
Aug.	2	Glasgow—Painting at Police Offices, &c.	Education Committee	Office of Public Works, 64 Cochrane Street, Belfast.
"	28	Gateshead—Cleaning and Painting at Schools	—	E. J. Harding, Education Offices, Gateshead.
ROADS AND CARTAGE:				
July	22	Conway—Portland Cement, &c.	Town Council	Borough Surveyor, Town Hall, Conway.
"	22	Levenshulme—Paving, &c.	Urban District Council	James Jepson, Guardian Chambers, Tiviot Dale, Stockport.
"	22	South Shields—Service Line	Town Council	S. E. Burgess, Chapter Row, South Shields.
"	24	Perth—Causeway Laying	Town Council	R. McKillop, 12, Tay Street, Perth.
"	24	Walkden, Lancs.—Setts	Urban District Council	J. A. Corson, Council Offices, Walkden.
"	25	West Ham—Making-up Street	Town Council	J. E. Morley, Town Hall, West Ham.
"	26	London—Making Roads, &c.	Metropolitan Asylums Board	Treadwell & Martin, 29A Charing Cross House, Charing Cross Rd., W.C.
"	26	Carshalton—Making-up Roads, &c.	Metropolitan Asylums Board	Treadwell & Martin, 29A Charing Cross House, Charing Cross Rd., W.C.
"	26	Tring—Repaving, &c.	Urban District Council	W. A. Thomas, Market House, Tring.
"	26	Morley—Tar Macadam	Education Committee	W. E. Putman, Town Hall, Morley.
"	29	Ellesmere Port—Making-up Roads	Urban District Council	J. M. Hudson, Bank Building, Ellesmere.
"	31	Prestwich—Street Works	Urban District Council	Surveyor's Office, Chester Bank, Prestwich.
SANITARY:				
July	21	Leicester—Sewers	Highways and Sewerage Committee	E. G. Mawbey, Town Hall, Leicester.
"	21	Brighton—Drain Pipes	Corporation	Borough Engineer's Office, Town Hall, Brighton.

Complete List of Contracts Open.—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
SANITARY—cont.			
July 22	Conway—Drain-pipes, &c.	Town Council ...	Borough Surveyor, Town Hall, Conway.
" 24	Altofts—Scavenging... ..	Urban District Council ...	J. C. Coates, Council Offices, Altofts.
" 24	Kew and Richmond—Conveniences ...	...	Borough Surveyor, Town Hall, Richmond, Surrey.
" 31	Axbridge—Sewerage Works ...	Rural District Council ...	A. Powell, 10, Orchard Street, College Green, Bristol.
" 31	Hawarden, Flint—Sewerage Works ...	Rural District Council ...	E. S. Taylor, 26, Newgate Street, Chester.
TIMBER:			
July 21	Whitehaven—Timber, &c....	Harbour Commissioners ...	J. Tipon, Harbour Office, Queen's Doll Quay, Whitehaven.
Aug. 1	Southampton—Boxwood Plotting Scales ...	Ordnance Survey ...	Officer in Charge of Stores, Ordnance Survey Office, Southampton.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
July 27	Bexhill, Sussex—School ...	£50, £30 and £20	£1 IS.	Secretary, Education Committee, Amherst Road, Bexhill.
Aug. 1	Hove, Sussex—Library ...	£50, £30, £20	£1 IS.	H. Endacott, Town Hall, Hove.
" 1	Perth—Reconstruction of Hall ...	30, 20 and 10 guineas	£1 IS.	J. Begg, City Chambers, Perth.
Sept. 3	Cheshunt—Library ...	...	£1 IS.	A. C. Lee, Manor House, Cheshunt, Herts.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Birmingham.—Accepted for the erection of public baths in Moseley Road, for the City Council:—

W. & J. Webb £22,929

Cardiff.—For rebuilding a portion of showrooms, erection of stables, &c. at premises in Working Street, for Messrs. Cross Brothers, Mr. Henry Budgen, F.R.I.B.A., architect, 95, St. Mary Street, Cardiff:—

W. Hopkins, Birmingham... .. £5,600 0 0
J. Gibson 5,253 0 0
J. H. Maggs & Co. 5,184 0 0
W. Thomas & Co. 5,163 0 0
J. Allan & Sons 5,110 0 0
W. Symonds & Co. 4,949 18 2
Knox & Wells... .. 4,848 0 0
G. Hallett... .. 4,800 0 0
S. Shepton & Son 4,645 0 0
E. R. Evans & Brothers 4,594 6 3
G. Griffiths & Sons 4,420 0 0
D. Davies... .. 4,259 0 0
E. Turner & Sons,* Penarth Road 3,965 0 0
* Accepted. (Rest of Cardiff.)

Cricklewood.—For the construction of reservoirs, &c., for the Metropolitan Water Board:—

J. & H. Robus £70,000 0 0
J. Best, Edinburgh 40,407 15 11
T. Adams 40,346 18 3
J. Dickson, St. Albans 38,604 1 3
Kirk, Knight & Co., Sleaford 37,661 0 0
J. T. Firbank, Ltd. 37,272 8 9
J. Mowlem & Co... .. 36,955 0 0
J. Aird & Son 35,707 9 8
Allen & Sons... .. 35,597 0 0
S. Pearson & Son 35,500 0 0
R. H. B. Neal, Plymouth... .. 35,383 0 0
S. Harrison & Co., Birmingham 34,473 0 0
D. R. Paterson 33,807 14 9
G. Hay & Co. 33,754 8 11
T. Doewra & Son 33,683 5 8
T. Smart, Nottingham 33,599 3 0
S. Kavanagh & Co., Surbiton... .. 33,373 15 6
Griffiths & Co. 32,667 4 8
Davies, Ball & Co., Hitchin 32,629 0 0
Muirhead, Greig & Matthews... .. 32,617 12 9
A. N. Coles, Plymouth 32,501 9 5
G. Wimpey & Co., Hammersmith 32,481 15 7
A. E. Nunn 31,766 2 5
G. Bell 31,697 3 3
Bower Brothers, Nottingham 31,500 0 0
Wallis & Sons, Maidstone 31,093 0 0
W. Manders, Leyton 31,045 5 10
Bott & Stennett 30,651 4 11
C. Wall 30,500 0 0
C. W. Wills, Manchester... .. 29,613 6 8
Kirk & Randall, Woolwich 29,280 0 0
H. Wilcocks & Co., Wolverhampton 29,262 15 5
C. Ford, Willesden 28,659 0 0
J. A. Ewart 28,010 6 8
Pethick Brothers 27,967 0 0
E. Nuttall & Co., Manchester... .. 27,848 2 5
W. Moss & Sons, Loughborough 27,440 7 1
Mayoh & Haley 25,700 0 0
J. Bentley, Bradford 25,443 17 8
[Rest of London.]

Farnham.—For the erection of almshouses, for the Trustees of the late G. McDonald. Mr. A. J. Stedman, architect and surveyor, South Street Chambers, Farnham, Surrey:—

W. White £3,914 8 6 ... 129 0 0
W. German 3,878 17 0 ... 128 7 3
J. Appleby & Sons 3,659 0 0 ... 90 0 0
Haslemere Builders, Ltd. 3,543 0 0 ... 87 0 0
Higgs & Outhwaite... .. 3,464 0 0 ... 40 0 0

A.
T. H. Hawkins & Co. £3,442 13 0 ... £125 0 0
A. Chuter 3,321 0 0 ... 156 15 0
Cæsar Brothers 3,310 0 0 ... 50 0 0
F. Knight 3,290 0 0 ... 120 0 0
Goddard & Sons 3,259 0 0 ... 137 0 0
W. Watson 3,165 0 0 ... 88 10 0
Lorden & Son 3,129 0 0 ... 84 0 0
Crosby & Co. 3,154 0 0 ... 105 0 0
F. Milton 3,116 0 0 ... 75 0 0
W. J. Snuggs 3,106 0 0 ... 65 0 0
Drowley & Co. 3,101 0 0 ... 60 0 0
Kent & Hall 3,077 1 8 ... 73 0 0
Tompsett & Co. 2,960 0 0 ... 100 0 0
G. Kemp 2,929 0 0 ... 75 0 0
Spear & King 2,920 0 0 ... 94 0 0
E. C. Hughes 2,858 5 3 ... 29 15 3
Martin, Wells & Co. 2,791 0 0 ... 81 0 0
A. G. Mardon 2,709 0 0 ... 40 0 0
[A.—Reduction if timber work in deal.]

Gloucester.—For the erection of a model steam laundry, for the Gloucester Model Laundry Co. Mr. J. Fletcher Trew, architect, County Chambers, Gloucester:—

Freeman & Jones £2,109
J. Gurney 2,020
W. T. Nicholls 1,999
W. Jones, jun. 1,916
J. Byard & Son 1,830
T. J. Williams 1,777
J. Simmonds* 1,765
* Accepted. [All of Gloucester.]

Hetton (Durham).—Accepted for the erection of a 9,000 h.p. generating station, and installation of electric haulage, coal-cutting and pumping plant at the collieries, for the Hetton Coal Co.:—

Bruce, Peebles & Co. £92,000

Hove.—For the erection of public elementary schools for about 600 children in Portland Road, for the Education Committee. Messrs. Clayton & Black, architects, 10, Prince Albert Street, Brighton:—

H. J. Penfold £7,867
Longley & Co. 7,558
Martin, Wells & Co... .. 7,500
W. A. Field & Co. 7,435
Lynn & Sons 7,418
Cook & Sons 7,200
Barnes & Sons 7,195
Parsons & Sons 7,190
H. A. C. Jay 7,150
Rowland Brothers 7,059
W. Brown & Sons 7,055
J. & M. Patrick 6,969
Hawkins & Co. 6,948
Hockley & Co. 6,864
Norman & Burt,* Burgess Hill 6,551
* Accepted.

Kirkcaldy.—Accepted for the erection of an elementary school to accommodate 1,000 children, for the Kirkcaldy Burgh School Board (exclusive of furniture, painting and electric light). Mr. D. Forbes Smith, A.R.I.B.A., architect, Kirkcaldy. Quantities by the architect:—

Mason—Balfour Brothers, Sinclair-town £3,598 0 0
Joiner—Bogie & Nicoll 1,894 0 0
Plumber—J. Wood & Son... .. 466 18 11
Plasterer—W. & J. Easton 366 0 0
Slater—Currie & Cant 264 0 0
Heating and ventilating engineer—Mackenzie & Moncur, Edinburgh 582 10 0
Ironwork—Thomson Brothers 397 14 5
Tiler—Daniel Ryrie, Edinburgh 144 17 10
Glazier—Cunningham & Co. 53 12 0
[Total £7,767 13 2.] [Rest of Kirkcaldy.]

Llantwit Major.—For the construction of a service reservoir, filter-beds, &c. at Frampton, for the Cowbridge Rural District Council. Messrs. Kirby, Son & Brown, water engineers, Newport, Mon.:—

F. Ashley, Cardiff... .. £6,661 1 10
S. Wood, Keynsham 6,421 6 10
Rees Jones, jun., Coychurch 6,263 0 6
Rhys Jones, Coychurch 6,035 7 2
Meredith Brothers, Castleton, near Cardiff 6,000 0 0

W. Jenkins, Bridgend... .. £5,470 12 3
W. Jones & Son, Neath 5,280 0 0
Pollard & Co., Taunton 5,256 7 0
H. Roberts, Ledbury 5,162 0 0
Barnes, Chaplin & Co., Cardiff 5,121 18 3
W. Westwood, Bromyard 5,071 4 0
McAven & Co., Cardiff 5,067 7 1
T. Taylor, Pontypridd 5,041 12 0
E. Tabor, Cambridge 4,961 1 8
Hitt & Sons, Bridgend 4,840 7 6
W. Brown, Merthyr 4,719 12 11
G. Rutter, Barry 4,656 6 10
A. G. Collins & Co.,* 32, Wynd Street, Cadoxton, Barry... .. 4,457 4 10
* Accepted.

London, S.E.—For additions, alterations and re-decoration of the Murphy Memorial Hall, New Kent Road. Mr. A. Conder, architect, Palace Chambers, 9, Bridge Street, Westminster. Quantities by Mr. C. E. Blomfield, 40, Finsbury Square, E.C.:—

Hudson Brothers £7,250
Staines & Son 6,960
J. Chapman 6,936
Stimpson & Co. 6,930
J. Grover & Son 6,882
Kirk & Randall 6,672
Holloway Brothers 6,616
W. Akers & Co. 6,594
F. & H. F. Higgs 6,580
J. Smith & Sons... .. 6,535
L. H. & R. Roberts 6,420
H. Young 6,316

London, S.W.—For rebuilding the public baths in Manor Street, for the Chelsea Borough Council. Messrs. Wills & Anderson, architects, 4, Adam Street, Adelphi, W.C. Quantities by Mr. F. H. A. Hardcastle, 5, Old Queen Street, Westminster:—

Sims & Woods £34,396 ... 100
Fryer & Co. 33,588 ... 100
W. Taylor & Co. 32,500 ... 500
Kilby & Gayford 32,125 ... 690
Spencer, Santo & Co. 31,900 ... 650
Godson & Sons 31,817 ... 176
Lole & Co. 31,662 ... 850
Appleby & Sons 31,522 ... 191
Strange & Sons 31,500 ... 700
Foster & Dicksee 31,424 ... 580
Johnson & Son 31,250 ... 700
C. Wall, Ltd. 31,111 ... 530
Bulled & Co. 31,107 ... 356
Dearing & Co. 31,000 ... —
Pattinson & Son 30,975 ... 624
Leslie & Co. 30,900 ... 500
Martin & Wells 30,840 ... —
H. L. Holloway 30,700 ... 1,000
Stimpson & Co. 30,577 ... 400
Holliday & Greenwood 30,546 ... 500
Kirk & Randall 30,500 ... 500
Patman & Fotheringham 29,997 ... 552
Croyple Brothers 29,974 ... 750
W. Lawrence & Son 29,973 ... 440
W. J. Renshaw 29,931 ... 1,280
Cowley & Drake 29,898 ... 540
D. W. Barker 29,872 ... 850
Willcock & Co. 29,827 ... 839
Lorden & Son... .. 29,800 ... 1,050
W. Johnson & Co. 29,715 ... 830
Prestige & Co. 29,440 ... 950
Wallis & Sons 29,400 ... —
W. G. Minter 29,220 ... 750
A. Hudson & Co. 29,200 ... 500
B. E. Nightingale 29,113 ... 1,200
W. Wallis 28,997 ... 1,060
C. Gray Hill 28,515 ... 534
A. N. Coles* 28,499 ... —
Chessum & Sons 28,429 ... 818
Galbraith Brothers 28,192 ... 943
A. Faulks 27,595 ... —
J. M. Patrick 27,592 ... 661
Garrett & Son... .. 27,592 ... —
A.—Addition for the reinforced concrete work being executed by the Expanded Metal Co.
* Accepted.

(Continued on p. xvi.)

Advertising Notes.

Advertising should have force enough to make people think as you want them to think! Confidence in your own business inspires faith in others.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT'S and SURVEYOR'S JUNIOR ASSISTANT (21) requires ENGAGEMENT. Working and detail drawings; good references: moderate salary.—Box No. 1191, BUILDERS' JOURNAL Office, 6, Great New Street, London, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT, 22; 6 years' experience, desires ENGAGEMENT, working drawings from rough sketches, perspectives, surveying, levelling, good tracer, colourist, general office routine. Salary moderate.—Box 1206, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT, 3½ years' varied experience, able to prepare working drawings from rough sketches; surveying, levelling, &c.; moderate salary.—X., 48, Thornton Avenue, Chiswick, W. 1240

ARCHITECT and SURVEYOR'S experienced and capable all-round ASSISTANT desires permanency. Thoroughly well versed in quantities, working drawings, construction, steelwork, details, surveying and levelling. Moderate salary.—H., Preston Villa, Markenfield Road, Guildford. 1238

ARCHITECT'S ASSISTANT (24) desires ENGAGEMENT. Good draughtsman. Designs, working drawings, details, perspectives, specifications; nine years' experience.—W. H. L., 83, Elspeth Road, Clapham Common, S.W. 1210

ARCHITECTURAL ASSISTANT (26) wants POSITION in architect's (or engineer's) office. Seven years' experience. Working drawings and details, surveying, perspectives, etc.—A. E. P., 35, Carpenter Road, Edgbaston, Birmingham. 1189

ARCHITECT'S ASSISTANT (32), Experienced Draughtsman and Designer, specifications and quantities, 55s. Country preferred.—TRAHO, 186, Worple Road, Wimbledon. 1237

ARCHITECT'S ASSISTANT requires situation; contract drawings half and full size, details, surveying, &c., and general office work. Moderate salary.—Box 1232, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (23), six years' Midland experience, chiefly domestic; surveys, working drawings, details, &c.; low salary.—Z., "Ingleside," Olton, Birmingham. 1253

BUILDER'S, &c. CLERK OF WORKS ASSISTANT (22); drawing, tracing, knowledge quantities and details; 4½ years in architect's office; certificates, building construction, advanced, 1st firehand, &c.—H. M. N., Thorncroft, Farnham, Surrey. 1243

CARPENTER and JOINER with 16 years' experience, wants piecework labour only or as working foreman; good references; distance no object; estimates given.—Apply, D. W., 58, Wellington Street, Gravesend, Kent. 1208

CLERK OF WORKS, good draughtsman, setter-out, sanitary engineering, quantities, seeks position as ASSISTANT; thoroughly practical, trustworthy, and reliable.—D., 9, Lambeth Palace Road, London, S.E. 1242

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12th July, 1905.

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Tenders, addressed to the "Board of Management," will be received at the CLERK'S Office, Cleveland Street Asylum, not later than TEN a.m. on MONDAY, 24th JULY, 1905, and will be opened on the same day at FOUR p.m.

The Board of Management do not pledge themselves to accept the lowest or any Tender then received.

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FRED. W. BAILEY,
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OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

TENDERS—cont. from p. xiii.

London, S.E.—For improvements to school, South Lambeth Road, Kennington, for the Board of Education:—

J. Grover & Son	£15,984
W. Downs	15,944
F. & H. Higgs	15,882
Patman & Fotheringham	15,723
Lathey Brothers	15,483
Killby & Gayford	15,359
Clarke & Bracey	15,118
J. Greenwood, Ltd.	14,959
W. King & Son	14,773
J. & C. Bowyer	14,587
H. L. Holloway	14,566
Lawrence & Son	14,404
Treasure & Son	14,383
J. & M. Patrick	14,270
W. Johnson & Co.	14,151
J. Appleby & Sons	14,089
W. Smith & Son	14,088
J. Marsland & Sons	13,855
J. Garrett & Son	13,773
E. Triggs, # 92, The Chase, Clapham	13,386

[Architect's estimate, £14,284]. * Accepted.

Manchester.—For the erection of a new bank and four shops at Longsight. Messrs. J. Earnshaw & Son, architects, King Street, Manchester. Quantities by the architects:—

T. Scott	£3,850
T. Mawdsley	3,849
T. Shaw	3,805
W. Thorpe	3,772
Young, Tinker & Young	3,765
Hill & Hayes	3,745
C. H. Normanton	3,716
Burgess & Galt	3,660
Gerrard & Son	3,654
E. Jackson	3,621
R. Carlyle	3,522

[All of Manchester.] * Accepted.

Portsmouth.—For the erection of the Copnor Road Council School, for the Education Committee. Mr. G. C. Vernon-Inken, architect and surveyor, 40, Commercial Road, Portsmouth:—

Armitage & Hodgson	£20,677	10	2
Dowdell	20,661	14	4
Kirk & Randall	20,618	0	0
Light & Son	20,600	0	0
Cook & Sons	20,315	0	0
W. Ward	20,117	0	0
Perkins & Durrant	19,590	8	0
W. W. Evans	19,375	0	0
Clarke & Son	19,103	0	0
Coltherup	18,823	6	9
Corke	18,591	18	10
Davis	18,500	0	0
Learmouth	18,494	3	7
Harding	18,443	13	0
Privett	18,365	0	0
Crockerell, # Portsmouth	18,127	5	6

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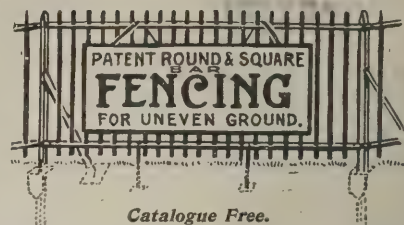
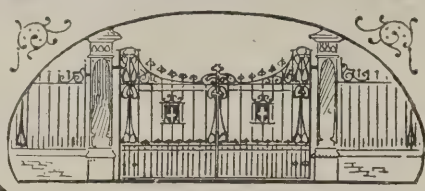
Tewkesbury.—For the construction of two concrete filter-beds at the waterworks pumping station, for the Corporation. Mr. J. S. Pickering, borough engineer, Municipal Offices, Cheltenham:—

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H. Page	2,571	18	7
A. J. Colborne	2,486	4	9
M. Williams & Co.	2,386	16	4
Collins & Godfrey, # Cheltenham	2,359	9	7

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(Continued on page xviii.)

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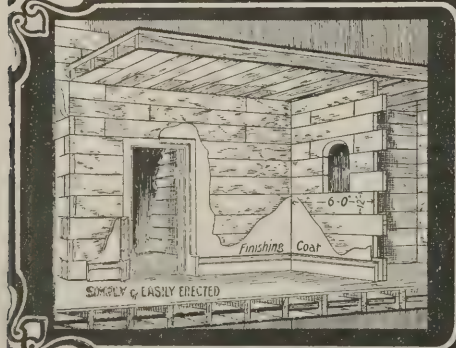
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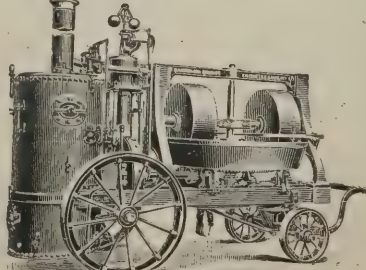
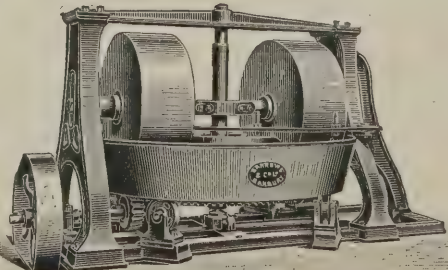
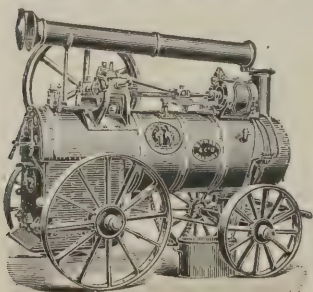
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TENDERS—cont. from p. xvi.

Portsmouth.—For the enlargement of the Royal Sailors' Home, for the Committee. Mr. G. C. Vernon-Inkpen, architect, 40, Commercial Road, Portsmouth:—

Kirk & Randall	£11,220
Corke	11,000
Clarke & Sons	10,908
Evans	10,800
Harding	10,715
Light & Son	10,300
Dash	10,298
Munday	10,238
Crockerell	10,236
Croad	10,112
Privett	10,098
Spriggings	10,020
Perkins & Durrant	9,997
Salter	9,991
Coltherup	9,890
Dugan,* Portsmouth	9,687

* Accepted.

Salisbury.—For the erection of proposed post-office, inland revenue offices, and county court, for the Commissioners of H. M. Works and Public Buildings:—

A. W. Long	£11,691	0	0
Hayward & Wooster	10,493	0	0
F. Merrick & Son	10,417	0	0
H. & C. Spackman	9,987	0	0
E. Walters & Son	9,950	0	0
E. Hall	9,890	0	0
Stephens, Bastow & Co.	9,734	0	0
Bird & Pippard	9,700	0	0
Webb & Co.	9,487	0	0
W. Webb	9,373	0	0
H. M. Patrick	9,000	0	0
A. J. Colborne	8,899	0	0
Wort & Way	8,750	0	0
Harris Brothers	8,475	0	0
J. Long & Sons	8,444	0	0
S. Salter*	8,361	0	0
G. Moore*	7,436	13	0

* Accepted.

Swansea.—For the erection of ten pairs of semi-detached villas on the Coedsaeson Estate, Sketty, Swansea, for the Committee of the Grosvenor Building Club. Mr. Harold Kennard, architect, 13, Railway Approach, London Bridge, and at Swansea. Quantities by Mr. John Moir Kennard, 13, Railway Approach, London Bridge:—

Waring, Cole & Waring, Neath	£11,366	18	0
F. Thomas & Sons, Seven Sisters	10,684	0	0
D. Jenkins, Swansea	10,500	0	0
G. Mercer, Llanelly	9,995	0	0
Price Brothers, Cardiff	9,951	0	0
J. & F. Weaver, Manselton	9,600	0	0
Lloyd Brothers, Swansea	9,615	0	0
T. Richards, Swansea	9,614	0	0
Pye, Parkinson & Co.,* Sketty	8,638	0	0
J. Richards, Sheffield	7,800	0	0

* Accepted.

Swansea.—For the erection of Libanus New Baptist Chapel, Cwmbwrla. Mr. H. A. Ellis, architect, 10, Fisher Street, Swansea:—

T. Richards & Sons	£4,810
Walters & Johns	4,800
Bennet Brothers	4,750
D. Jenkins	4,699
Lloyd Brothers	4,490
J. & D. Jones	4,400
J. & F. Weaver*	4,100

[Architect's estimate, £4,376]. [All of Swansea].

* Accepted.

South Ealing.—For the erection of a mission hall. Mr. W. A. Pite, architect, 116, Jermyn Street, St. James's. Quantities by Mr. W. J. Falkner, 19-23, Ludgate Hill, E. C.:

Chambers Brothers	£2,230
Myring & Son	2,229
Garrett & Son	2,214
W. Blackburn	2,200
Barrett & Power	2,163
R. H. & R. Roberts	2,079
Chinchen & Co.	2,077
J. Dorey & Co.	2,047
L. Whitehead & Co.	2,030
J. Appleby & Sons	2,020
W. J. Dickens	1,990
F. J. Messom & Sons	1,975
H. Flint,* High Wycombe	1,917

* Accepted.

Teignmouth.—For the erection of an isolation hospital, mortuary, laundry, administrative block, &c., for the Urban District Council. Mr. C. F. Gettings, C.E., M.R.S.I., surveyor and water engineer:—

Bird & Pippard, Yeovil	£3,240	0	0
R. F. Yeo & Sons, Torquay	3,161	15	9
F. J. Badcock, Ashburton	3,059	3	6
W. E. Bennett, Plymouth	2,991	2	10
R. Wilkins & Sons, Bristol	2,978	0	0
W. T. Stevenson, Plymouth	2,950	0	0
S. Roberts, Plymouth	2,949	6	4
G. Lee, Teignmouth	2,896	6	9
F. C. Francis, Teignmouth	2,886	15	4
A. N. Coles, Plymouth	2,862	17	7
W. E. Blake, Plymouth	2,830	0	0
E. Andrews, Teignmouth	2,761	9	9
F. J. Stanbury, Devonport	2,761	0	0
Pethick Brothers, Plymouth	2,744	0	0
G. H. Marshall,* Birmingham	2,584	1	6

* Accepted.

Tunbridge Wells.—For the erection of a country cottage at Hartfield, for Mr. W. Wooding Starmer. Mr. W. Kirk, architect, Withyham, Tunbridge Wells:—

J. Jarvis & Son	£1,049
J. Luxford	1,036
Soper & Jones,* Tunbridge Wells	1,000

* Accepted.

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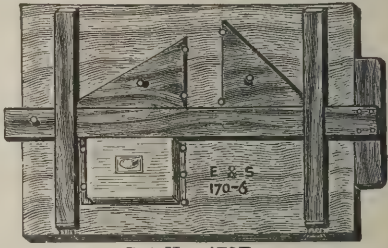
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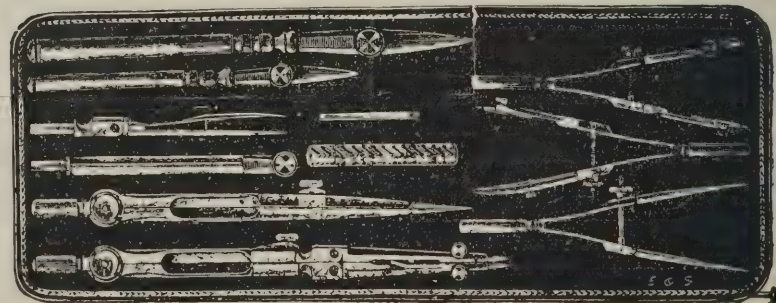
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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

July 26, 1905. Vol. 22, No. 546.

6, Great New Street, Fetter Lane, E.C.

Summary.

The Institute Bill for the enrolment of architects has been issued. It is recommended that the Architects' Act of 1906 (as it is called) shall come into force on July 1st, 1907, and that thereafter no one shall be allowed to call himself an architect without having secured the necessary certificate. (Page 54.)

The foundations of Liverpool Cathedral, though commenced in October last year and employing about 180 men, will not be completed till next March. To support the great twin towers, piers each 32ft. square at the base and tapering to 16ft. square at the top, have been built taken down in some instances to a depth of 50ft. The portion of the cathedral now in progress, representing not one-half of the whole structure, is estimated to cost £370,000. (Page 45.)

An excellent book on the planning of flats, by Mr. Sydney Perks, F.R.I.B.A., has just been published. It is very fully illustrated, and gives examples of flats abroad as well as those in this country. (Page 46.)

The National Competition designs are now on exhibition at South Kensington. Among the architectural designs Mr. Robert Atkinson, of Nottingham, secures a silver medal for his design for a lounge and staircase in a large hotel—the same which gained for him the R.I.B.A. Tite prize this year. There is a good show of designs for stained glass, wallpaper and wrought-iron, and the designs for tiles, furniture, wood-carving, &c., are interesting. (Page 48.)

The crowded state of Westminster Abbey, on account of the numerous monuments there, was the subject of debate in the House of Commons last week. Mr. Balfour indicated that it was about time they held their hand against further encroachments. (Page 49.)

A synopsis of the chief recommendations of the Royal Commission on London Traffic is given on page 52.

The Cheap Cottages Exhibition at Letchworth (Garden City) was opened yesterday. A large number of cottages have been erected with the idea of keeping the cost below £150, some of these being by well-known architects, who also submit designs for other cottages. (Page 55.)

The Council of the Cardiff, South Wales and Monmouthshire Society of Architects protests against the hurried way in which the designs for branch libraries at Canton and Cathays have been judged, and asks that the matter be referred back to the assessor, Mr. H. V. Lanchester. (Page 44.)

The pass list for the R.I.B.A. Midsummer examinations is given on page 52.

£5,000 is required for the restoration of Chichester Cathedral. Mr. Somers Clarke is directing the work. The experiments with baryta water on the tower have been very successful. (Page 45.)

The Institute Registration Bill.

ON another page of this issue will be found the text of the Institute Registration Bill, or, as it is called, the Bill for the Statutory Enrolment of Architects. We need hardly say that this will be studied with the greatest interest. There are no startling proposals embodied in it, but a number of points are defined which hitherto have been the subject of much speculation. It will be seen that the Act is proposed to come into force on July 1st, 1907. Provision is made for the inclusion of all *bona-fide* architects of two years' standing and for those persons who have served for ten years as pupil, apprentice or assistant to anyone entitled to be enrolled at the passing of the Act; and there is, too, the wide scope in the clause for including any person who has "such other qualification as may be approved by the Board," which claim is possibly intended to embrace the surveyor or civil engineer who practises as an architect: but of course the difficulties and defects of the first roll have always been recognized, and there is no occasion now to cavil at it. After the Act has become law, however, admission on the roll is to be only of those who have qualified by compulsory examination and by not less than five years' service with "a person enrolled or entitled . . . to be enrolled": though here again maybe the surveyor or civil engineer shows himself behind the mask: as also in the clause governing the charges for professional services, to which there is the special proviso that "nothing herein contained shall prejudice the right of professional members of the Institution of Civil Engineers or Surveyors' Institution to recover charges for work of any kind falling within the duties of their respective callings." We assume the Institute is now committed to the Bill, and in the next session of Parliament its introduction may perhaps be looked for.

Imported Materials.

WITH the exception of timber and ready-made joinery, we are not very much dependent in this country on imported materials for our buildings, though so far as concerns some internal fittings the trade is not free from that distinguishing mark of the foreigner—more so especially of the Teuton—which is so much resented in some other branches of industry. Indeed, the complaint about articles "Made in ——" is so familiar that it is refreshing to find one of our American contemporaries complaining about something of the sort even in that most wonderful Utopia across the sea. The thorn seems to have been that a certain millionaire saw fit to employ some stone from a foreign quarry in the erection of his house, as if there were nothing good enough for him in America,

and this is occasion enough for our contemporary to observe with customary American pride: "This land of our own abounds with materials of every kind for building purposes and can match and even excel every possible sample of stone from any and all of the quarries of Europe, and besides offer a greater profusion of varieties of each kind of stone than can be found in any foreign land. Take the list of American marbles, granites, limestones and sandstones, and they cannot be duplicated in the world, nor either one of them, for quality, for price, nor for the profusion in which they are offered to the selection of the intending purchaser." Selah.

Conditions of Competitions.

THERE has recently been cause to draw attention to the non-compliance with the conditions in certain competitions. It seems scarcely necessary to point out that in order to judge a number of designs submitted in any competition it is imperative that a copy of the conditions for competitors should be available, and it would be very helpful indeed if committees always provided a copy when holding an exhibition of designs. In glancing round such an exhibition there are often many designs which attract the eye and are really very well conceived, but as the test should be for the design most fulfilling the particular conditions set, these designs may be quite inferior to others which have recognized the restrictions or possibilities of the case and have been entirely governed by them. One would expect an assessor to be always aware of this, but from the recent discussion which has taken place it is evident that even assessors are likely to be at fault. In fact, they seem to fall into two classes—the one which is inclined to be impressed more by the artistic quality of the design, and the other by the planning and construction; hence, it has been suggested that a third assessor should always be appointed in competitions of any magnitude so as to bring about a more equitable result, though it might very possibly happen that the third assessor was a man of the same view as one of the others, in which event there would be two opinions, in the scale against one. The fallibility of assessors was instanced at the meeting of the Institute when the matter was under discussion, and the remark of one speaker is especially worth repeating, that three assessors could not be better than the ideal one, the best possible assessor that could be got; but that there were not enough best possible single assessors to go round, and therefore they had better try to get the best possible jury. However this may be, the strict selection of designs in compliance with the conditions set is a very important matter, and too much attention cannot be given to it.

CARDIFF LIBRARIES COMPETITION.

Protest against the Assessor's Award.

THE Council of the Cardiff, South Wales and Monmouthshire Society of Architects protests against the hurried way in which the designs for branch libraries at Canton and Cathays have been judged by the assessor, Mr. H. V. Lanchester. The number of designs submitted was twenty for each library, the first-premiated designs being by Messrs. Speir and Beavan and Mr. E. M. Bruce Vaughan.

Writing to the Library Committee of the Cardiff Corporation, the Council says: "We think that in view of the large amount of time and thought spent on these designs, competitors are entitled to have more time spent in their consideration, and we are convinced that had this been done the result would have been much more satisfactory, especially as a careful view and comparison of the designs exhibited is sufficient to convince any professional architect who is familiar with the requirements and the ordinary rules of library planning that there are designs in the room which are superior to those selected. It is also desired to call attention to clause 13 of the conditions, which states that if any design fails to conform to the conditions it will be excluded from the competition.

Violations of the Conditions.

"The first-premiated design for Canton violates clause 18 and also clause 21 as regards cost, *i.e.*, it is obvious that it cannot be carried out in its present form for the sum allowed. The second-premiated design for Canton violates clause 30, inasmuch as the librarian's room is only about 90ft. super. instead of 150ft. super. The first-premiated design for Cathays violates the intention of the conditions, inasmuch as no use can be made of the staff entrance without exceeding the limits of the site. The second-premiated design for Cathays violates clauses 18 and 21 as regards cost, *i.e.*, it cannot be carried out in its present form for the sum allowed.

"All the premiated designs show disregard of the ordinary rules of library planning, particularly with regard to the distances between the bookcases and tables, and obviously to provide the proper spaces would necessitate an entire rearrangement of the plans.

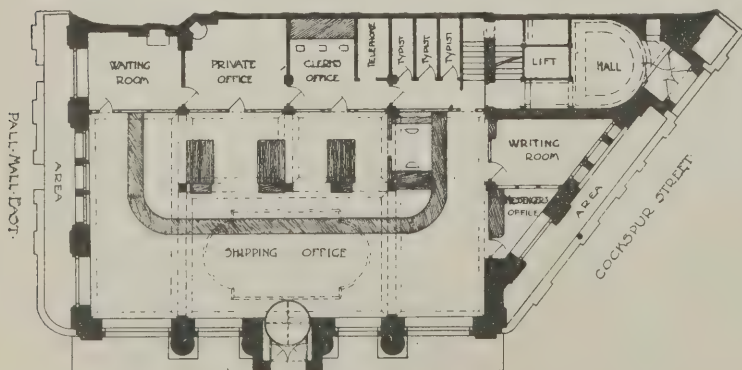
"In two of the premiated designs the ends of the bookstacks abut on the back walls so that circulation around them is impossible, and in addition to this no counter has been shown on the inside of the turnstiles for the staff enclosure, without which it would be impossible to work the library, and there is no room to put such an enclosure without altering the whole of the lending department. Clause 13 of your conditions is very clear, and as all the premiated designs have failed to comply with the conditions we respectfully ask you to refer the matter back to your assessor."



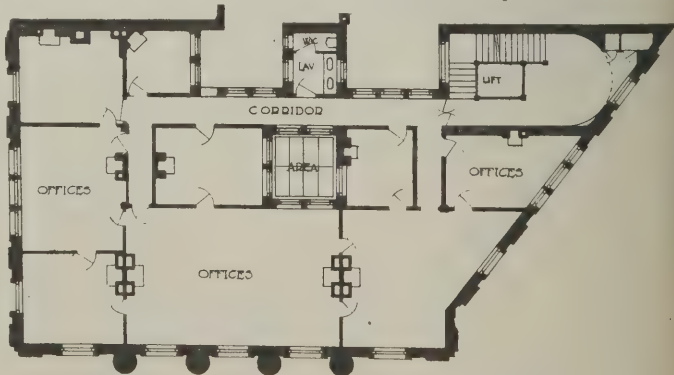
NEW SHIPPING OFFICES.

THE new offices illustrated on this page have recently been completed for the International Navigation Co., Ltd., combining the Red Star, White Star and other lines, the architect being Mr. Henry Tanner, junr., A.R.I.B.A., of London. The building faces down Pall Mall, and has frontages to Cockspur Street and Pall Mall East. It has been erected by the Waring-White Building Co., Ltd., but not on the American method employed by them at the Ritz Hotel, Piccadilly, where the steel framework of the building was built up without the aid of outside scaffolding, and the stone and brickwork attached to it afterwards. There is a considerable amount of steelwork at these shipping offices, but the walls are solid and take the weight.

The stone is best Whitbed, supplied by Messrs. John Pearce & Co., of Portland, and worked by the Bath Stone Firms, Ltd., at their masonry works at Portland. The accommodation is shown by the accompanying plans. The large office on the ground floor is lighted from three sides, and the offices at the back are top-lighted. The woodwork is American walnut, with oxydized steel-bronze fittings and interlocking rubber-tiled floor. A drawing of the building is exhibited at this year's Academy. The architect was influenced in his design by the fact that the site belongs to the Crown, and it is ultimately proposed to treat the whole block as one with the College of Physicians and the Union Club at the east end, which fact accounts for the carrying round of the main cornice at an unusually low level.



GROUND-FLOOR-PLAN.



SECOND-FLOOR-PLAN.

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THE ERECTION OF LIVERPOOL CATHEDRAL.

Progress of the Foundations.

IT is just over a year since the foundation-stone of Liverpool Cathedral was laid by His Majesty the King. Since then a great deal has been done towards the erection of this huge building. The work of excavating for the foundations commenced in October last year, but although the contractors, Messrs. Morrison & Sons, of Wavertree, have kept about 180 men regularly employed, the foundations will not be completed until next March; in other words, nearly a year and a half will be occupied in the foundation work of a portion of the cathedral which does not represent one-half of the whole structure. The section which is now being prepared for the superstructure

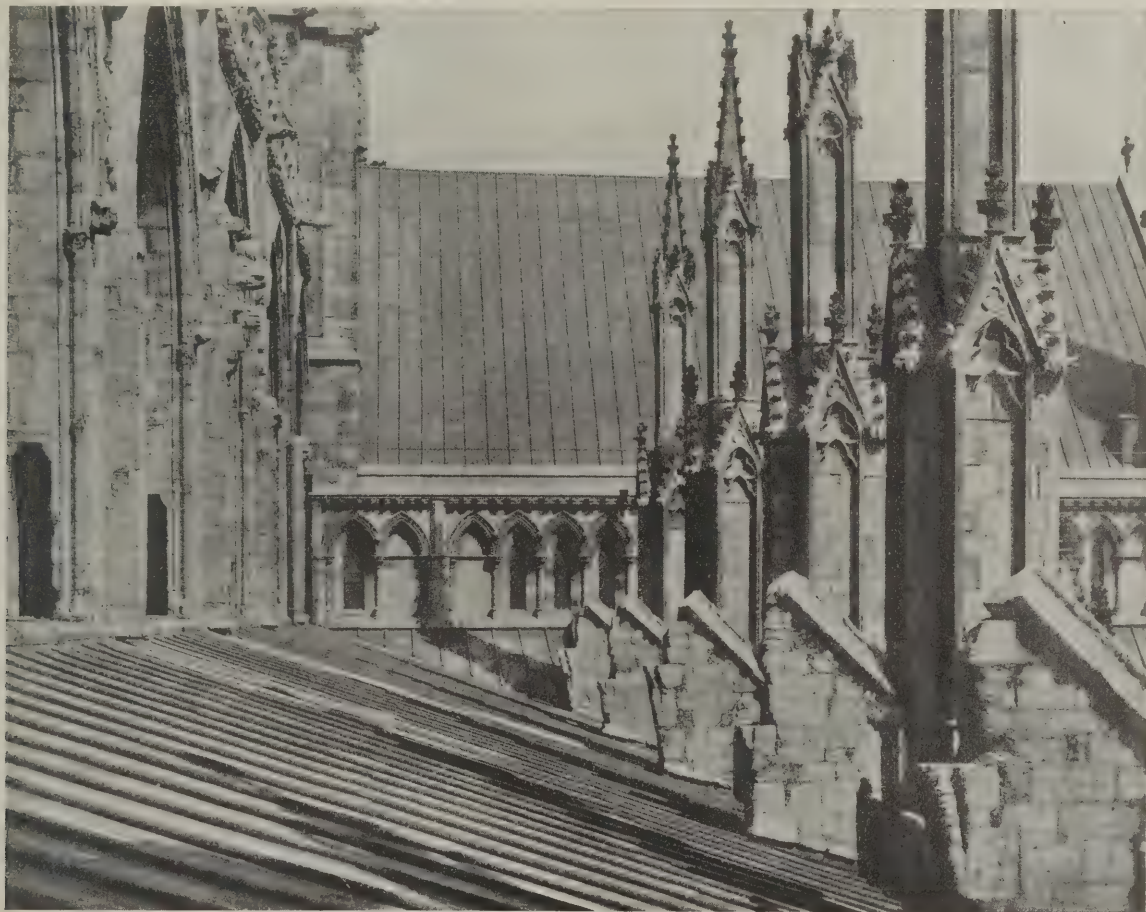
ones to 35ft., giving a rock average of 43ft. So far as the western tower is concerned, the only pier as yet built to the ground level is the one which bears the stone laid by His Majesty.

The chapter-house and the east portion of the vestries are situated on the cemetery side, and in consequence the excavations have had to be taken to an average depth of 43ft. from the datum or nave floor line. These foundations are about half finished. On the western side rock was struck very close to the surface, with the result that it was only necessary to take the foundations for the Lady chapel to an average depth of 7ft. In order, however, to afford an easy and level approach to the Lady chapel, chapter-house and vestries from St. James's Road, the Mount has been cut away over an area of 200ft. by 150ft. to a depth of

CHICHESTER CATHEDRAL.

Statement by Mr. Somers Clarke.

SPEAKING at the recent meeting of the Chichester Cathedral Repair and Restoration General Committee, held at Brighton, Mr. Somers Clarke said he believed £5,000 would be sufficient to do what was required. But, as everyone was aware, when an ancient building had to be dealt with it was impossible to say what might be revealed. Chichester Cathedral had undergone perhaps more internal volleys than any similar building now remaining in the country, and finally with the terrific crash of the centre tower it was obvious many parts of the building might have been slightly shaken, although there was nothing now to cause apprehension. The experiments with baryta water on the



THE YORK MINSTER DISPUTE: PINNACLES AND REMAINS OF FLYING BUTTRESSES ON SOUTH SIDE OF NAVE.

As reported in our columns, considerable discussion has been going on in reference to the rebuilding of the flying buttresses shown in the above view. There is no doubt that the buttresses did originally exist complete, as no fewer than seven old prints in the Minster library represent them so, but they were suffered to get out of repair and were partially or entirely pulled down at a time when any taste or care for church architecture was at its lowest ebb. The nave is not stone vaulted, but has a timber roof, and on that account objection to the re-erection of flying buttresses has been made: nevertheless it is a fact that the roof is pushing out the clear-story walls, and Mr. Bodley's contention that the addition of the flying buttresses is most desirable seems to us indisputable in view of the actual state of things. Readers will find a number of interesting illustrations of the Minster in an Eighth Occasional Paper recently published by the Dean, to whom we are indebted for the above photograph.

includes the Lady chapel, the chapter-house, the eastern vestries, the choir up to the crossing of the transepts, and the two great twin towers, but the funds for the erection of the latter are not yet available: these towers are to be each 275ft. high: the central tower of York Minster is 200ft. high.

Foundations for the Great Towers.

The foundations of the eastern tower and the Lady chapel are finished, and excavations are proceeding apace in connection with the chapter-house and vestries, and the heating and blowing chambers, which are to come under the western tower. The foundations of these gigantic towers both comprise four piers, each 32ft. square at base and tapering to 16ft. square at the top. It was found necessary to take the two outer piers of the eastern tower on the cemetery side down to a depth of 50ft. and the inner

14ft. About 2,000 tons of earth and yellow sandstone were thus removed.

The portion of the cathedral now in progress is estimated to provide accommodation for 3,500 worshippers, and, exclusive of the cost of the great towers, the expenditure is likely to reach £370,000, towards which amount about £270,000 has been subscribed or promised; leaving £100,000 still to be raised.

Sir William Forwood was able to announce last week that the Lady chapel will probably be completed within the next five years, but from ten to twelve years must elapse ere the remainder is ready for divine service.

The joint architects of the cathedral—which will be the largest in England, and with three exceptions the largest in the world—are Mr. G. Gilbert Scott and Mr. G. F. Bodley, R.A.

campanile had proved very successful indeed and the committee were now going on applying it to the octagon at the top of the tower. Then there were the north-east and the south-east turrets to be built, and other important work was the repair of the roof. As soon as the damp got through the lead roof into the gutters it fell into the pockets of the vaulting, collected in a puddle, and went through, making stains and marks. Therefore as the money was collected it should be set aside in two separate sums, taking, say, two-fifths for the work to the bell tower now in progress and three-fifths for the roof, until there was enough money collected for the roof for doing one whole piece. (At Chichester, besides the restoration of the cathedral tower, the reconstruction of the old Oliver Whitby Bluecoat School and the extension of St. Mary's Hospital are being carried out).

Views and Reviews.

A Standard Book on Flats.

It seems strange that, though so many books have been published on architecture and construction, we are still without treatises in English on several types of buildings which are continually being erected throughout the country and in regard to which there is a great deal to learn from the experience of others; thus there is no book in English on the planning of town halls and municipal buildings; neither is there a good book on libraries, and until recently there was not a comprehensive treatise on schools. The book now before us fills in another deficiency, namely, the planning of all classes of flats and tenements.

By the growth of cities the housing problem has become extremely difficult and complicated, and there are scores of points for the architect to solve in respect to the planning of flats. This book, therefore, by Mr. Sydney Perks, will be heartily welcomed. It is excellently done, well arranged, and illustrated in the best possible manner, the numerous plans being all very clearly drawn and reproduced to a good size, so that it is possible to follow the internal arrangements with the greatest facility. As these plans are the work of so many different architects we are sure a great deal of trouble must have been involved in presenting them in the uniform manner of this book. The lettering is in every case clear, and a scale is given always, this latter being a most important item when it is recollected that the planning of flats involves the provision not only of the most workable arrangement of rooms but also

their placing so as to obtain the utmost space for each. Moreover, the author does not confine himself to flats in England, but very wisely introduces a large number of examples from Paris, Vienna, Madrid, Holland and America. This is especially commendable, as the planning of flats on the Continent, more especially in France, has always been recognized as very skilful, embodying many features of merit.

In the introductory chapter Mr. Perks deals with the historical side of the subject, making special reference to the flats of the seventeenth and eighteenth centuries in Old Edinburgh. In these flats it was, and often still is, customary to find the bed in a large cupboard enclosed by doors, and this bed recess is often adopted in modern French plans. It certainly has the advantage of giving a very neat appearance to the room, but we hardly think that it has any other merits. The author observes that although the buildings of the sixteenth and seventeenth centuries were similar to one another, and no doubt were built on the lines of earlier buildings, when we come to the eighteenth century the plan is entirely different, the w.c. being placed in the centre of the building, without any external ventilation, the reason for this probably being that the old buildings had no drainage, while the new buildings were provided with such, and it was thought that everything being taken away at once by pipes the closet would always be pure and untainted. In the nineteenth century, with the advance of sanitary science, all this of course was abandoned.

A number of examples of old flats in London are given, and then the author proceeds to deal with the numerous details

in the planning of modern examples. We have not the space to go into a tithe of these, and we can only say that they are all dealt with very fully and clearly, points of detail being often illustrated by small parts of plans showing, for example, the best arrangement of the hall, bathroom, kitchen, &c. With regard to this last, attention is drawn to the desirability of placing the kitchen within easy service of the dining-room, but we quite agree that it is a mistake to carry the idea so far as to spoil the remainder of the plan, because, as regards the keeping of things hot, and the smell of cooking, it makes very little difference whether the dishes have to be carried roft. or zoft. The author thinks it better to put the kitchen next the dining-room rather than the drawing-room; and he does not favour a serving hatch as it allows sound from the kitchen to pass easily into the dining-room, which is not at all desirable. Sculleries, he considers, should be abolished, as they are abroad, a sink in the kitchen being all that is required.

The ideal plan for a high-class suite of flats is one that has all the servants' rooms well cut off from the other part of the suite so as to form, in fact, another suite inside the main suite, with an entrance door. Such an arrangement is given in the plan of Alexandra Court, Queen's Gate, on the opposite page. Here, it will be seen, there is a central courtyard in each wing, with two suites on each floor and one suite at the back. This has the least passage room, as the rooms are grouped around the lit. The flats facing the courtyard are preferable to the others, as the servants' bedroom is well away from the kitchen, and the w.c. is placed between them. The plan of Kensington Court Mansions, also taken from this book and given on the opposite page, is only a small portion of a very large block of flats. The servants' quarters are so isolated from the other rooms that they could be let as a separate suite. A servant going to open the entrance door would not pass through the entrance hall. Slops would not be taken through the kitchen, and all sound or smell of cooking is cut off by two doors. The arrangement of the w.c.'s is economical.

In chapter III. Mr. Perks deals with artisans' dwellings, giving particulars of buildings of this class erected in London, Birmingham, Liverpool and other towns. The author then proceeds to give a great number of plans, illustrated with a few elevations and photographs, of modern flats erected in different parts of London, each being accompanied by some critical note. Chapter V. is concerned with practical notes relating to floors, ceilings, partitions, staircases, windows, &c., and then follows a collection of examples from abroad, nearly every one of these plans having had to be re-drawn and the English scale marked. Chapter VII. deals with financial matters relating to the subject, while the concluding chapter (VIII.) gives forms of agreement for the letting of flats.

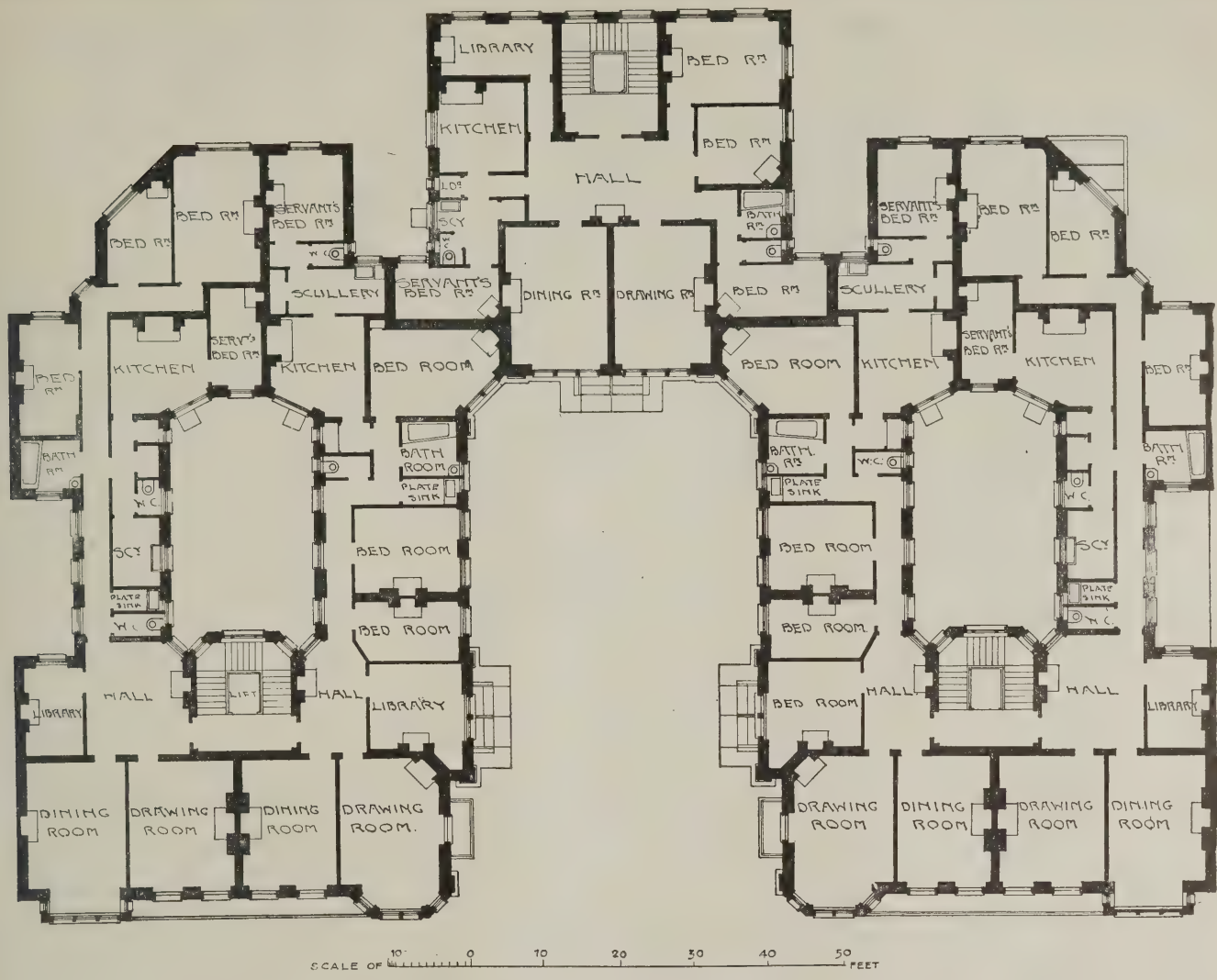
We can only repeat that the book is in every sense admirable, and all architects who are concerned with the subject should not fail to have this volume on their shelf.

"Residential Flats of all Classes, including Artizans' Dwellings," by Sydney Perks, F.R.I.B.A. London: B. T. Batsford, 94, High Holborn, price 21s. nett.



THE DESIGN OF FLATS: NOS. 18, 19 AND 20, FOLEY STREET LONDON, W.
PROF. BERESFORD PITE. ARCHITECT.

Classes in Engineering and Building Construction at the Goldsmiths' Institute. — Students living in south-east London will be interested to learn that the evening classes previously held in engineering and building subjects at the Goldsmiths' Institute are to be continued during the session 1905-6. This has been made possible by a grant from the London County Council to the University of London for this specific purpose; the work being under the control of a delegacy appointed from both bodies.

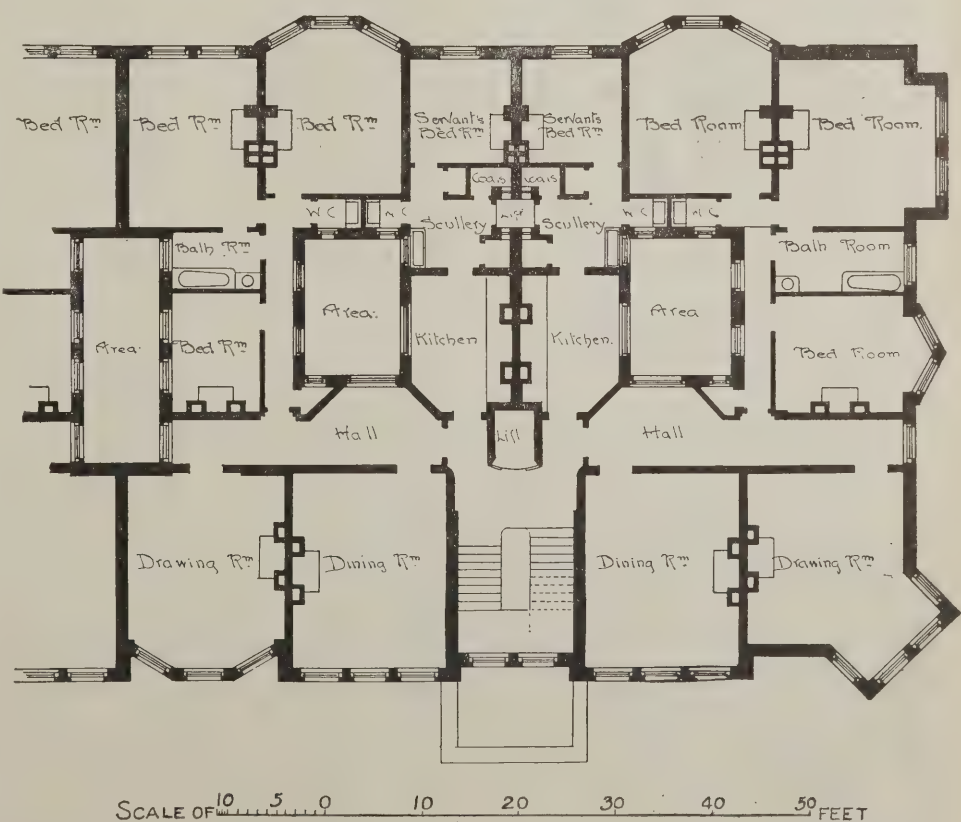


THE PLANNING OF FLATS: ALEXANDRA COURT, QUEEN'S GATE, LONDON. PAUL HOFFMANN, ARCHITECT.

Correspondence.

A Recreation Club for Architectural Students.
To the Editor of THE BUILDERS' JOURNAL.
 SIR,—I am very pleased to see Mr. Gordon's letter. A social club for students has always struck me as being particularly estimable. The Architectural Association does little or nothing to foster the social element among its members, though many students would, I am sure, be only too glad to join such an institution as that suggested. There they could meet others of their craft and find some relaxation from the difficulties and trials of office routine. —Yours truly,
 E. C. MORGAN WILLMOTT.
 KENSINGTON.

Plumbers' Fittings at King's College.
To the Editor of THE BUILDERS' JOURNAL.
 SIR,—Alluding to the reference to a report of the Education Committee of the London County Council on p. 27 of your issue for July 12th, will you allow me space to say that the offer made by the Plumbers' Company was not unconditional, or, as implied, a free gift, but that the workshops, fittings and appliances provided by the Company at King's College at considerable cost should, for the purpose of extended use for the advanced instruction of plumbers, be placed under the charge of a joint committee of representatives of the London County Council and the Plumbers' Company with that object. —Yours truly,
 W. R. E. COLES.
 Clerk, Worshipful Company of Plumbers.
 LONDON.



THE PLANNING OF FLATS: KENSINGTON COURT MANSIONS. PERRY AND REED, ARCHITECTS.



TWO COTTAGES AT LETCHWORTH (GARDEN CITY). ROBERT BENNETT, A.R.I.B.A., AND WILSON BIDWELL, ARCHITECTS.

In the design of these cottages at Letchworth (Garden City), near Hitchin, in Hertfordshire, the great aim has been simplicity, to use local materials in a local manner, and to get some of the very pleasing effects found in the plain rough-cast gables which form the feature of the Hertfordshire cottage. The cottages have a roof of local red hand-made tiles, brought low in front to form a shady sitting-out place, partly screened from sun and wind. The walls are of brickwork, rough-cast and lime-whited, with rough-cast chimney stacks and red pots. The paint is bright green outside and white inside. The plan provides a large living-room, 17ft. 6ins. by 14ft., with open fire recess, cross-lighted by either east or west window, as the case may be. The studies have sunny south bays. On the first floor are four good-sized bedrooms (all with fires), also bathroom and w.c. The cost was £580 per cottage.

NATIONAL COMPETITION DESIGNS.

THE prize designs submitted in the National Competition for 1905 are now on exhibition at the Victoria and Albert Museum, South Kensington. The number of works sent up for examination this year was as follows:—13,674 from 260 schools of art and branch schools; 1,573 from 93 science evening schools and day classes; 1,519 for 168 art evening schools and day classes, and 38 from two technical institutions. Nine gold medals have been awarded, 61 silver medals, 249 bronze medals and 427 book prizes.

Architectural Designs.

In this section Mr. Robert Atkinson, of Nottingham, secures a silver medal for his design for a lounge and staircase in a large hotel—the same which gained for him the R.I.B.A. Tite prize this year. This is quite the best of those exhibited, the only other design of merit being that for a tomb to G. F. Watts, by Mr. Henry Bannister, of Regent Street Polytechnic, to which a silver medal is also awarded. In their report on the architectural designs, the examiners (Mr. John Belcher, A.R.A., Mr. Reginald Blomfield, A.R.A., and Mr. T. G. Jackson, R.A.), observe that the regrettable falling-off in the quality of the work reported on last year is continued. Many of the designs submitted were so entirely lacking in all the essentials of architectural design as to show that the students had received no instruction of any architectural value. Such works, amongst which were some glaringly bad designs for churches, received a condemnatory mark from the examiners, and they should not have been submitted for competition.

Measured Drawings.

Among these there is nothing of particular interest exhibited. Mr. Robert Atkinson gains a silver medal for drawings of the chapter-house doorway of Southwell Cathedral, Mr. James Freeman a bronze medal for drawings of the gateway to St. John's College, Oxford, Mr. W. Dathy Quirke, of the Birkbeck College, a bronze medal for drawings of St. Benet's Church, Paul's Wharf, E.C., and a few other bronze medals for work of no special merit. In connection with the study of modern buildings, the examiners desire to call special attention to their remarks of last year, as to the necessity

of greater care being taken to select only good examples. In spite of the remarks then made, the examiners regret to find instances of wrong selection, and they would impress upon masters the fact that the study of bad modern examples is calculated to do the students nothing but harm. The examiners note the many instances in which students submit a long series of bays and arches of one type. There is no occasion for this prodigality in time and labour, one example of each kind being sufficient for the purposes of study. In some cases architectural sculpture is shown in outline only, which is misleading, and in others a good drawing in pencil is accompanied by a copy in ink. Such work is largely a waste of the students' time.

Designs for Tiles.

The general character of the work, although of very fair average quality, is not equal to that of last year, and the examiners have not found anything of sufficiently high merit to warrant the award of a gold medal; but they again commend the improvement shown in the choice of colour. A silver medal is awarded to Mr. Albert Hackney, of the Burslem School of Art, for a bold and successful design for majolica tiles, in which the colour is well chosen, the surface well covered and the general form graceful in effect; and a bronze medal is awarded to Mr. James Bancroft, of the Macclesfield School of Art, for two ambitious designs for panels, which would have commanded a higher award if the figures had been better drawn. A bronze medal is also awarded to Miss Margaret May, of the Carlisle School of Art, for a skilful design for stencilled wall tiles.

Stained Glass.

There is a good show of work in this class. The examples from the Birmingham School of Art are distinguished by intelligent understanding of the technique of stained glass, and great taste and inventiveness in design. A silver medal has been awarded to Mr. Bertram Lamplugh, of the Birmingham School of Art, for a clever design for a stained-glass window and for a set of exceptionally interesting designs for quarries. The devices in the latter are exceedingly inventive, appropriately executed, and well-adapted for glass. A silver medal has also been awarded to Miss Ethel Rhind, of the Dublin School of Art, for an excellent design for a window, showing a proper use of

shading; and another silver medal to Miss Margaret A. Rope, of the Birmingham School of Art, for an imaginative design well-planned for treatment in glass.

Wallpapers.

In this section there is a notable improvement both in the quantity and the quality of the work, which seems to have attracted students of more ability than has been the case in recent years. Generally speaking, there is a better understanding of the technical requirements of the manufacture of wallpaper, though there are some instances in which the lines of the design run too close together, so much so as to inevitably entail clogging in the actual printing. Other designs are marked by want of taste and bad colouring, while some of a more ambitious type, introducing figures, though not without merit, are unsuccessful as ornamental repeating designs. Friezes are generally inferior to the fillings they accompany, and indeed, as a class, are less successful than the other designs. The examiners are glad to notice an absence of the affectation and eccentricity which have been so much in evidence in recent years, and to observe indications of the decorative appreciation of beautiful natural forms.

Furniture, Woodcarving, Gesso-work, &c.

The average of excellence is on the whole rather higher than last year, though no individual work reaches a sufficiently high level to warrant the award of a gold medal.

Structural Metalwork.

There is a decided advance upon the standard of last year in the legitimate treatment of wrought-iron in those designs which are executed in the material. Some designs show want of appreciation of the capacity and limitations of wrought-iron. A silver medal is awarded to Mr. Albert Halliday, of the Bradford (Technical College) School of Art, for a design for wrought-iron hinges and lock-plate for a church door, showing the form of a cross cleverly suggested by the space between the ends of the hinges. It is unfortunate that the dignity of the whole is injured by the character of the lock-plate, which is not in harmony with the simplicity of the remainder of the design. A bronze medal is awarded to Mr. Alfred B. Jones, of the Birmingham School of Art, for a thoroughly well constructed design for a sign bracket.

Taken as a whole, the exhibition maintains the progressive tendency observed in recent years, and is well worth a visit. It is open till the end of August, from 10 to 10 on Mondays, Tuesdays and Saturdays, and from 10 to 6 on Wednesdays, Thursdays and Fridays; Sundays, 2 to 7.

The Quarrying of Box and Monk's Park Stone.—In the course of a recent visit paid by the Portsmouth Master-Builders' Association to Bath an inspection was made at the famous quarries of the Bath Stone Firms, Ltd., at Box and Monk's Park. On arriving at Box a visit was paid to the underground workings from which the well-known St. Aldhelm Box Ground stone is quarried. The workings run for many miles underground; in fact, it is estimated there are sixty miles of workings throughout the whole of the company's underground stone mines. The visitors were very much struck with the coolness and the purity of the atmosphere. Massive stones—one of 10 tons' weight—were shown, having just been severed from the rock. At the Box workings the visitors were able to walk straight into the side of the hill, but at Monk's Park it was necessary to descend 80ft. or 90ft. under the surface by means of a sloping shaft. The Monk's Park quarry workings are somewhat higher and more capacious than those at Box, and great interest was manifested in the quarrying of the stone.

IN PARLIAMENT.

(By Our Press Gallery Representative.)

IT has been decided by the sub-committee in charge of the arrangements in connection with the memorial to Sir William Harcourt that the statue should be placed in the members' lobby of the House of Commons, and that the execution of the memorial should be entrusted to Mr. W. Story, of Rome.

The propriety of removing the Cornwell monument in Westminster Abbey has been debated in the House of Commons as well as in the House of Lords, and Mr. Balfour generally defends the proposal of the Dean of Westminster to make room for the Salisbury memorial by curtailing the monument to Captain Cornwell. He, however, admits that if it is the general opinion among the public that the proposals are not suitable, he will use his influence to prevent them being carried out.

A new Bill relating to Public Monuments.

Sir Elliott Lees raised the discussion in the Commons by introducing a Bill to prevent the removal of public monuments in cathedrals and churches without Parliamentary sanction; but by the action of the Speaker, who was assured that the Bill would not come into operation till 1907, the debate was adjourned after Mr. Balfour had replied to Sir Elliott on the subject of the Salisbury memorial. The Bill, of course, will not be further heard of this session.

The Crowded Abbey.

In the discussion referred to Mr. Balfour spoke of the crowded state of the north transept of the Abbey, and said that to put the memorial to Lord Salisbury there would render that part impossible from an architectural point of view. He thought they had almost reached the time when a much more drastic Bill than that proposed by his honourable friend was needed, by which it would be laid down that no money voted by the country should go to a full-sized statue or effigy of any statesman, soldier or sailor, however distinguished his services or great his career.

Bridge over the Serpentine.

Lord Balfour, replying to a question by Captain Jessel, who wished an explanation of the delay in repairing the bridge over the Serpentine, stated that it was not advisable to commence the repairs to this bridge during the season owing to the obstruction which would be caused to the traffic. It was intended to commence the work as soon as Parliament rose, and to complete it by some date in October.

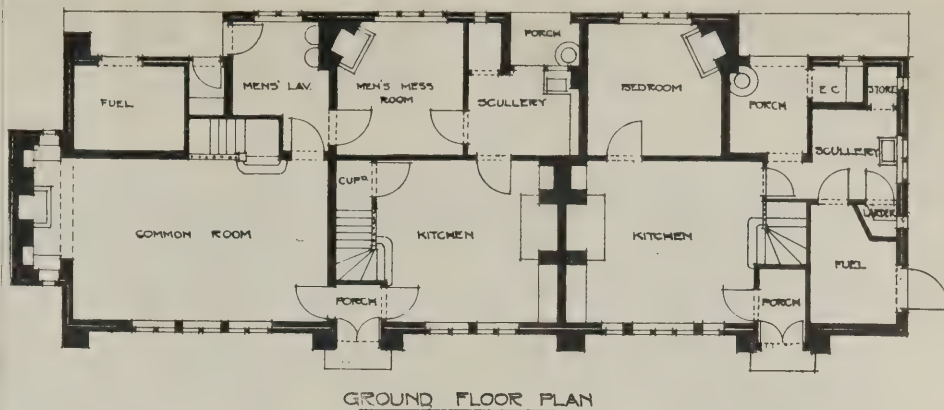
Overtime at Ordinary Wages.

Mr. Sydney Buxton asked the Financial Secretary to the War Office whether Messrs. Playfair were carrying out a building contract in connection with the Woolwich Dockyard, and whether in connection with the contract the men employed were working the hours of men recognized by the Master-Builders' Association and the Amalgamated Society of Carpenters and Joiners, namely, 6.30 a.m. to 5 p.m., or whether they had to begin work at an earlier hour at ordinary rates of wages.

Mr. Bromley Davenport replied: It would appear that the men employed on this contract are working overtime at ordinary rates of wages. Enquiry will be made of the contractors as to the practice.

Messrs. Waygood and the new Sessions House Lifts.

Mr. Keir Hardie asked Lord Balfour whether it had been represented to him that Messrs. Waygood & Co., liftmakers, who were now executing Government contracts at the new Sessions House, Old Bailey, and



GROUND FLOOR PLAN

SCALE OF 10 5 0 10 20 30 FEET

COTTAGES AT ABINGER, SURREY. W. DUNN AND R. WATSON, ARCHITECTS.

the Land Registration Office, was a non-union firm which made it a condition of employment that none of its workers should be members of the Amalgamated Society of Engineers or any other trade union, and that the conditions under which joiners and French polishers worked were in violation of those sanctioned by the trade unions, and what action he intended to take in connection with those representations.

Lord Balfour stated that the First Commissioner of Works was not responsible for the building and equipping of the new Sessions House, Old Bailey: The United French Polishers (London) Society had made a representation to the First Commissioner regarding the non-employment by Messrs. Waygood of union men. The First Commissioner having made careful enquiry was satisfied that Messrs. Waygood did not discriminate in any way as regards the employment of union or non-union workmen as joiners. It appeared that in the polishing shop some men had been required to state whether they were unionists or not, but that had been done without the knowledge of the directors, who had given instructions that it should not occur again under any circumstances. In the execution of any Government work with which they might be entrusted Messrs. Waygood would of course be required to conform to the spirit and

intention of the resolution of the House of Commons of February 17th, 1891.

OUR PLATES.

THE cottages at Abinger, Surrey, are built with hollow walls of stock bricks, lime-whited outside, and the roofs tiled. The external doors and the window frames are of oak, the sashes having iron frames with lead lights. In one end of the building is a common room on the ground floor, and cubicles for the use of unmarried outdoor men-servants on the owner's estate, the centre and other end being built as ordinary cottages for married people. Messrs. W. Dunn & R. Watson were the architects, and Messrs. W. & G. King, of Abinger Hammer, Dorking, were the builders.

The house near Edgerton, Huddersfield, is built of local stone of broken colour, with stone slates on the roof. The site is elevated. The entertaining rooms are panelled with oak. A conservatory of stone has been added on the garden front, filling the angle of the entrance. Mr. Edgar Wood was the architect, and Mr. Mark Brook, of Huddersfield, the builder. All the woodwork was executed by Messrs. Wood & Sons, of Huddersfield, and the casements were supplied by Messrs. George Wragge, Ltd., of Wardry Works, Salford, Manchester.



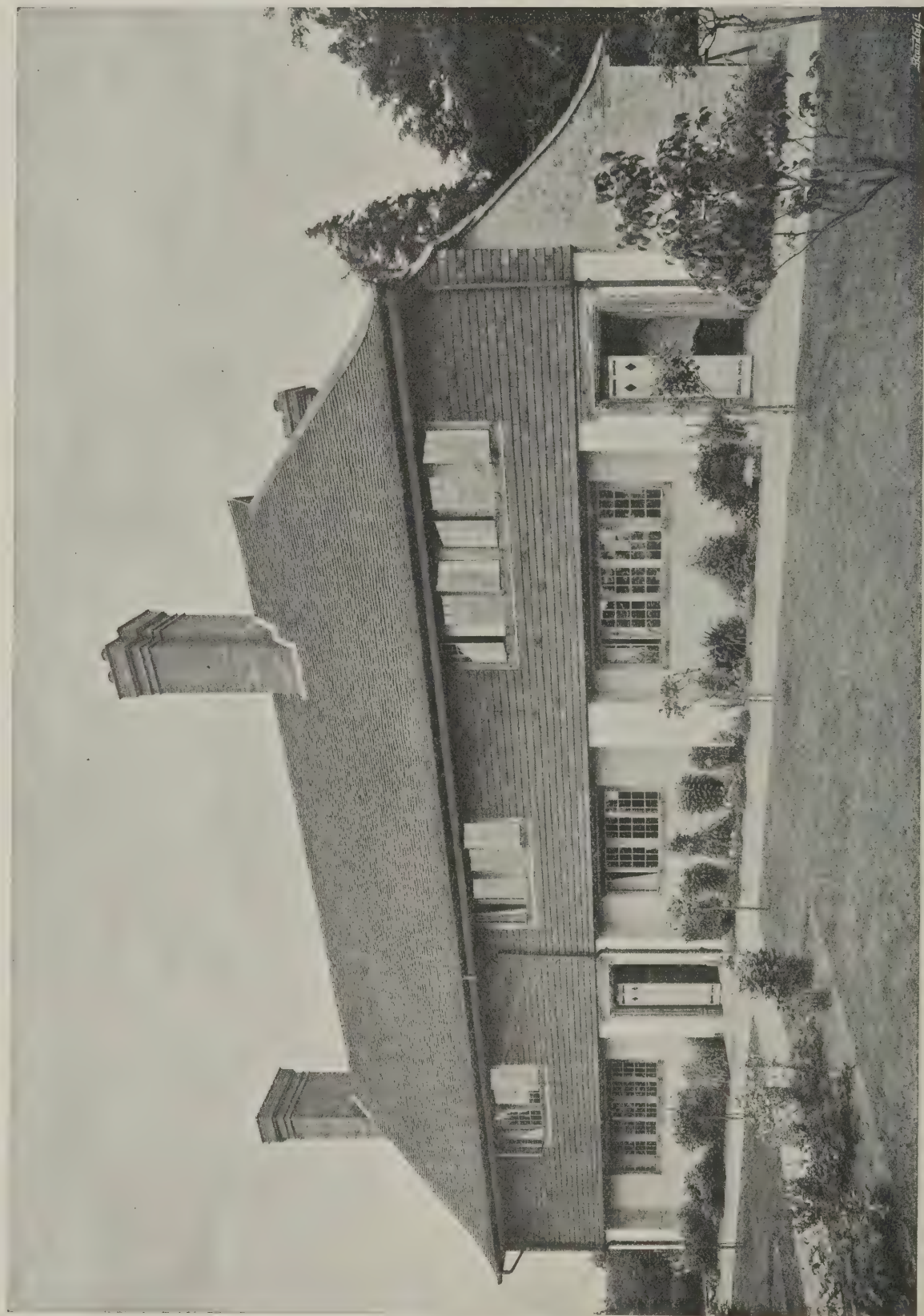
GROUND FLOOR PLAN

HOUSE AT EDGERTON, NEAR HUDDERSFIELD. EDGAR WOOD, ARCHITECT.



BED ROOM PLAN

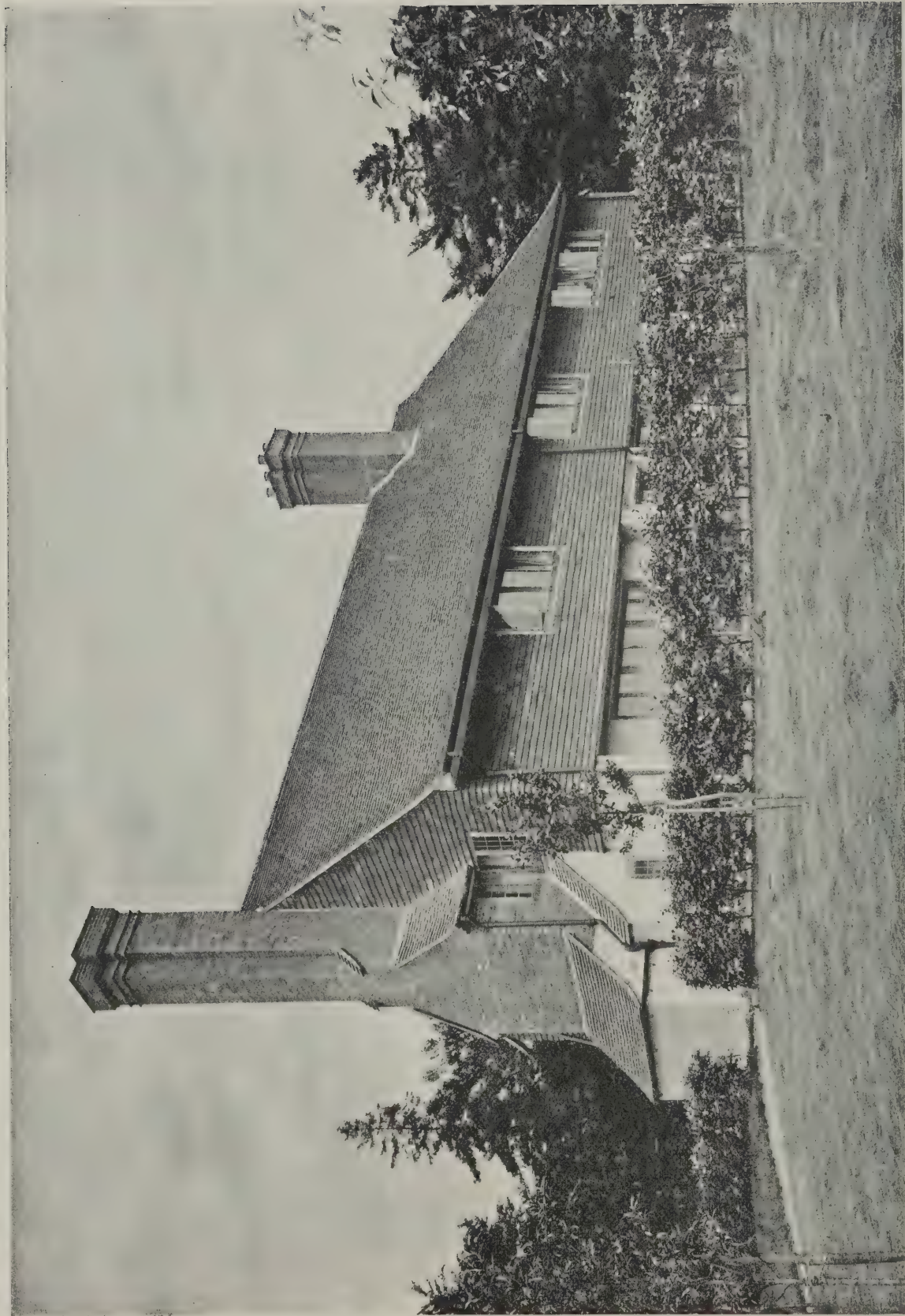
10 20 30 40 50 60 70 80 90 100 Feet



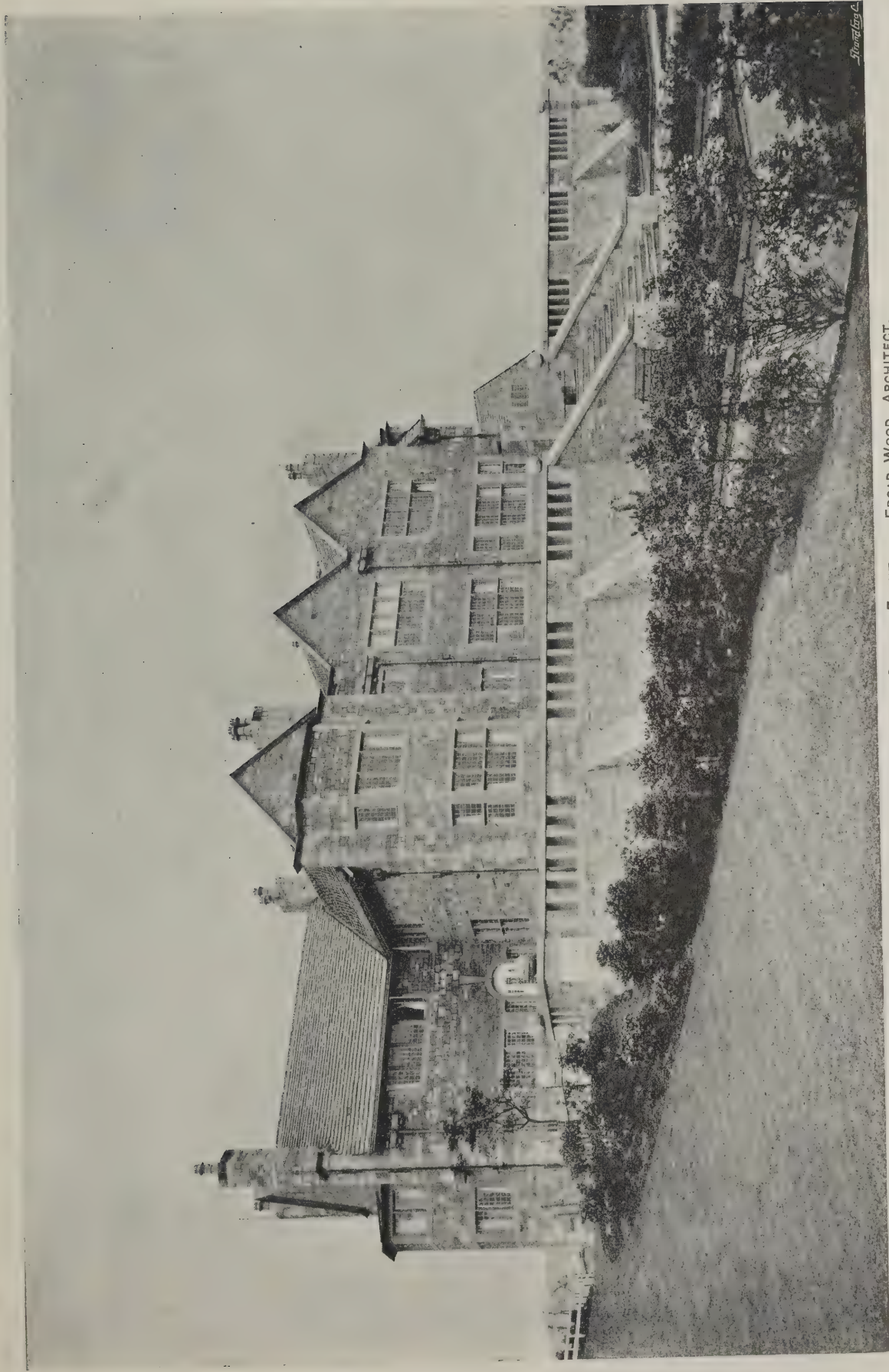
COTTAGES AT ABINGER, SURREY: FRONT VIEW. W. DUNN AND R. WATSON, ARCHITECTS.

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, July 26th, 1905.



COTTAGES AT ABINGER, SURREY. W. DUNN AND R. WATSON, ARCHITECTS.



HOUSE AT EDGERTON, NEAR HUDDERSFIELD: GARDEN FRONT. EDGAR WOOD, ARCHITECT.

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COTTAGES AT ABINGER, SURREY: BACK VIEW. W. DUNN AND R. WATSON ARCHITECTS

R.I.B.A. MIDSUMMER EXAMINATIONS.

THE following is the pass list in the Midsummer examinations of the Royal Institute of British Architects:—

Preliminary.

The preliminary examination, qualifying for registration as Probationer R.I.B.A., was held in London and the under-mentioned provincial centres on June 6th and 7th. Of the 245 candidates admitted, fifty-three claims for exemption from sitting for the examination were allowed. The remaining 191 candidates were examined with the following results:—

District.	Number examined.	Passed.	Relegated.
London - - -	78	48	30
Belfast - - -	1	1	-
Birmingham - -	8	5	3
Bristol - - -	15	11	4
Cardiff - - -	7	2	5
Glasgow - - -	6	4	2
Leeds - - -	26	17	9
Manchester - - -	31	14	17
Newcastle - - -	19	15	4
	191	117	74

The passed candidates, with those exempted—numbering altogether 170—are as follows:—

W. N. Adams (Liverpool)
J. A. Allan (Aberdeen)
T. S. Allan (Glasgow)
S. P. Allen (Cheddar)
C. S. Archer (Johnstone, N.B.)
C. D. Arnott (Gorleston-on-Sea)
G. T. Arthur (Bristol)
J. T. O. Aynsley (Sunderland)
D. W. Ayre (Cork)
W. F. E. Badcock (Bishop Auckland)
V. Bain (Sunderland)
W. A. Banks (Stafford)
S. R. Banks-Smith (St. Leonards-on-Sea)
T. H. Barrow (London, S.E.)
W. A. Batty (Wolsingham)
J. K. Beal (Newcastle-on-Tyne)
B. Beetham (Darlington)
W. Bell (Bradford)
T. Bennett (Gravesend)
W. B. Binnie (Airdrie)
A. C. Blackmore (Cottingham)
G. Bramwell (Gargrave-in-Craven)
W. G. Brett (Clevedon)
H. W. Brittan (Croydon)
A. St. H. Brock (North Cheam)
J. Brodie (Edinburgh)
T. H. Broomhall (Haigh, Barnsley)
W. G. Brown (Leighton Buzzard)
A. Bryett (Manchester)
S. H. Burgess (West Hartlepool)
P. Butlin (Rothwell)
W. W. Caithness (Ealing)
H. D. Champion (Balham, S.W.)
H. M. Chippindale (Scholes, Leeds)
C. Christie (Falkirk)
P. Coates (Sheffield)
A. V. Cole (Watford)
D. Colville (Aberdeen)
W. B. Cook (Huddersfield)
G. J. Coombs (Bournemouth)
F. Coyle (Blackhill)
R. Craddock (Wolverhampton)
R. H. Crook (Southport)
J. A. Davidson (Knock, co. Down)
R. H. Dewhurst (Harrogate)
F. A. Doggett (Cambridge)
A. M. Durrant (Hemel Hempstead)
C. D. Eckstein (Wolverhampton)
B. J. Emery (Lowestoft)
H. D. Emms (Southend-on-Sea)
R. W. Featherstone (Canterbury)
W. S. Fisher (Wellingborough)
G. E. Fitzgerald (London, W.C.)
E. G. Fletcher (Ulverston)
N. D. Fourdrinier (Brook Green, W.)
R. W. Furniss (Loughborough)
R. T. Garrow (Aberdeen)
H. V. Godfrey (Shepherd's Bush)

J. H. Gray (London, W.)
W. Green, junr. (Aberdeen)
S. Greig (Clapham Common)
H. C. Gieves, junr. (South Shields)
F. V. Griffin (Ealing)
F. Grissell (Notting Hill Gate, W.)
J. K. Ground (Wandsworth Common, S.W.)
C. O. ap Gruffydd (Wellingborough)
N. W. Hadwen (London, W.)
F. W. Hagell (Whitehall Park, N.)
E. S. Hall (West Dulwich)
H. S. Hall (Nottingham)
C. A. Hallatt (Wath-on-Dearne, Rotherham)
P. K. Hanton (Islington)
W. H. Harrison (Blackburn)
K. W. Hartland (Bristol)
E. H. Hawkins (Southampton)
F. Heath (Warsop, Mansfield)
J. Heelis (Bolton)
F. E. Henson (Wellingborough)
J. R. Hindmarsh (Newcastle-on-Tyne)
J. G. Hinton (Exeter)
C. O. Hooper (Southampton)
T. C. Howitt (Hucknall Torkard)
A. E. Hughes (Newark-on-Trent)
W. H. Jackson (Balham)
R. Jeffrey (Ashford)
R. E. Jew (Reading)
L. P. Johnson (London, S.E.)
W. Kaula (South Hampstead)
H. L. Knapman (London, N.W.)
H. F. Kohler (London)
C. S. Legat (Sunderland)
J. D. Lucas (Woking)
J. C. McAleer (Wokington)
F. W. Marshall (Solihull, Birmingham)
F. N. D. Masters (Doncaster)
F. J. McC. Maxwell (Bedford Park, W.)
R. Mayhead (Reading)
C. Medley (Keighley)
F. E. Mennie (Mile End, E.)
H. Michalowsky (Dalston, N.E.)
W. S. Mills (Leicester)
H. Monk (Durham)
D. H. Morgan (Aberdare)
G. C. Nairne (Inverness)
T. H. Needham (Acton)
H. W. O'Reilly (Cheltenham)
O. L. Owen (Swansea)
W. McP. Page (London, S.W.)
H. C. Perry (Bournemouth)
A. N. Peto (Leeds)
J. C. Pocock (Chiddingfold)
E. J. Polglase (Bristol)
J. Pollard (Hollywood)
F. Powell (Bradford)
H. C. Powell (Buxton)
W. S. Purchon (Tooting Common, S.W.)
R. Pywell (Hanwell, W.)
E. A. R. Rahbula (Clapham, N.E.)

F. Rattenhuber (Shepherd's Bush)
W. D. Rees (Cardiff)
W. C. Rhodes (Chelsea, S.W.)
L. Rigby (Manchester)
R. H. Riley (Lr. Darwen)
R. L. Rollo (Glasgow)
S. W. Ross (London, S.W.)
F. J. St. Aubyn (Battersea)
E. J. Scaife (Bolton)
E. R. D. Selway (Stourbridge)
N. F. Shanks (Manchester)
A. G. Sheath (Eastbourne)
E. P. Shelbourne (Melton Mowbray)
C. A. Smeed (Stratford)
F. W. Smith (Newark-on-Trent)
J. R. B. Smith (Furze-cote, Botley)
L. Smith (Huddersfield)
E. A. Spurling (St. Leonards-on-Sea)
G. Stanley (Trowbridge)
M. J. Stead (Halifax)
C. H. Stock (Carlisle)
E. W. Stubbs (Norwich)
H. C. Talbot (Ilford)
G. C. Thompson (Gateshead)
A. K. Thorn (Wandsworth Common, S.W.)
P. A. Tilden (Northwood)
A. J. E. Toone (C-on-M., Manchester)
H. Trepess (Warwick)
K. W. Turner (Ipswich)
G. A. Vallance (Mansfield)
P. J. N. Vincent (Plymouth)
H. Walker (Hull)
W. D. Walker (Halifax)
H. G. Warren (Exeter)
H. E. Watkinson (Goodmayes)
F. E. Watson (South Ealing, W.)
R. W. Webb (Bristol)
F. P. Webster (Sheffield)
A. B. West (Abingdon)
J. L. West (Abingdon)
C. Whitby (Sandown, I.W.)
N. A. Whitham (Barnsley)
E. S. Wilde (Weston-super-Mare)
W. H. Wilkinson (Halifax)
A. Winch (Roundhay, Leeds)
J. E. Winfield (London, N.W.)
P. M. Wood (Manchester)
B. W. Woodhouse (Carlisle)
G. G. Wormum (Hampstead, N.W.)
L. Worth (Bournemouth)
S. Wright (Macclesfield)
H. Young (Portsmouth).

Intermediate.

The intermediate examination, qualifying for registration as Student R.I.B.A., was held in London and the undermentioned provincial centres on June 6th, 7th, 8th and 9th. One hundred and fifty-seven candidates were examined with the following results:—

District	Number examined.	Passed.	Relegated.
London - - -	93	44	49
Bristol - - -	10	6	4
Glasgow - - -	5	5	0
Leeds - - -	18	13	5
Manchester - - -	24	15	9
Newcastle - - -	7	5	2
	157	88	69

Names in order of merit as placed by the Board of Examiners:—

C. D. Davy (Maidenhead)
W. J. M. Thomasson (Bournemouth)
W. Harvey (London, W.)
A. G. Henderson (Glasgow)
J. M. Jenkinson (Sheffield)
A. Binning (Blackheath, S.E.)
H. Moss (Manchester)
E. Morley (Bradford)
H. Lidbetter (Carlisle)
A. W. Kenyon (Sheffield)
A. G. Bray (Bolton)
S. J. Wearing (Leicester)
A. S. Constable (Stockfield-on-Tyne)
J. W. Corney (Leeds)
F. Woods (Maidenhead)
D. A. Adam (Newcastle-on-Tyne)
F. Donaldson (Bishop Auckland)
N. J. Dawson (Foxhall, Ipswich)
L. W. Edmonds (Balham, S.W.)
F. Meakin (London, E.C.)
W. R. Spurr (Batley)
P. May (Dulwich, S.E.)
R. W. Orme (Oldham)
G. E. Dunnage (Worcester Park)
J. Carey (London, S.W.)
A. H. Brownrigg (East Dulwich Grove, S.E.)
T. H. Hill (Hale)
H. L. Hicks (Newcastle-on-Tyne)
G. B. Wills (London, E.C.)
R. B. Ling (Lavender Hill, S.W.)
A. J. T. Abel (Clapham, S.W.)
A. Rusbridge (Reading)
R. C. Young (Bristol)
W. Pritchard, junr. (Lancaster)
A. P. Hartnell (Bristol)
S. Birkett (Manchester)
C. H. Simpson (London, W.C.)
W. Whitehead (Leeds)
C. R. Corfield (Falmouth)
T. S. Rushworth (Clapham Road, S.W.)
L. S. Nicholls (Birmingham)
J. P. Salvey (Reading)
J. H. Vaughan (Ilford)
H. Healey (Manchester)
C. P. Walgate (Beverley)
C. W. Clark (Plymouth)
W. H. Harral (Leicester)
A. E. L. Bower (Liverpool)
W. R. Webster (Aberdeen)
G. H. Rowledge (Manchester)
J. G. Young (Alloa, N.B.)
F. E. Collington (Nottingham)
H. G. Warlow (Sheffield)
C. B. Maltby (Leicester)
C. L. Reinmann (St. Leonards-on-Sea)
C. L. Wright (West Kensington)
P. Caminsky (Manchester)
G. H. Goldsmith (Manchester)
C. H. White (Bristol)
A. H. Fitzroy (Lincoln)
G. Colles (Cheadle Hulme)
A. N. Cotterell (Bristol)
J. J. Crowe (Bradford)
A. H. Douglas (Maida Vale, W.)
A. Dunn (Gloucester)
W. H. Ellison (North Barnsley)
C. G. Fullford (Salisbury)
C. Groves (Chester-le-Street)
W. Guthrie (Clapham, S.W.)
A. W. Hall (Ealing)
W. F. Helm (Glasgow)
R. C. Hunter (Edinburgh)
M. Idle (Clapham, S.W.)
W. I. Keir (Melksham)
F. G. Leonard (Chatham)
H. Y. Margary (Upper Tooting, S.W.)
E. S. Petch (Scarborough)
H. M. Pett (Brighton)
R. A. H. Phipp (Trowbridge)
C. V. Ponder (Hastings)
C. A. Reed (Clapham Common, S.W.)
W. Rose (Cardiff)
H. R. Sayer (Peckham, S.E.)
J. H. Sayner (Harrogate)
G. S. Twizell (Newcastle-on-Tyne)
H. Unwin (Bolton)
F. J. Watson (Forest Gate)
F. C. Webster (Broughty Ferry)

Final.

The final and special examinations, qualifying for candidature as Associate R.I.B.A., were held in London from June 23rd to 30th. Of the seventy-four candidates examined, twenty-one passed and the remaining fifty-

three were relegated to their studies. The successful candidates are as follows:—

* L. N. Barrett (Harrow)
A. A. Carder (Clapham Common, S.W.)
* O. S. Doll (Lancing)
G. L. Elkington (London, E.C.)
G. F. Ely (Liscard)
C. L. Fleming-Williams (Clapton, N.E.)
J. L. Fouracre (Plymouth)
L. U. Grace (London, W.C.)
W. C. Le Maître (London)
J. H. Markham (West Hampstead, N.W.)
L. T. Moore (Great Yarmouth)
V. Myer (London, W.C.)
J. J. S. Naylor (London, W.)
H. Prince (London, E.C.)
W. D. Quirke (Hove)
* E. Reid (Sunderland)
* Percy Robinson (Leeds)
S. Searle (Harrow)
N. Thomas (London, N.W.)
J. W. Walker (Aberdeen)
W. E. Watson (London, S.W.)

The following table shows the number of failures in the Final examination:—

I. Design - - -	40
II. Mouldings and Ornaments - - -	37
III. Building Materials - - -	19
IV. Principles of Hygiene - - -	16
V. Specifications - - -	22
VI. Construction: Foundations, &c. - -	19
VII. Construction: Iron and Steel, &c. -	27

* The candidates to whose names an asterisk is prefixed entered for the Special Examination, which is for architects in practice not less than twenty-five years of age, and chief assistants over thirty. Such candidates are exempted, by special resolution of the Council, from the Preliminary and Intermediate examinations, and from submitting Testimonies of Study.

TWO GREAT NEW STREETS.

CONSIDERABLE interest has been evinced during the past week by the publication of the first of the eight volumes embodying the report of the Royal Commission on London Traffic. A very large number of recommendations are made by the Commission, but undoubtedly the most important are those relating to the construction of two great new thoroughfares running across the metropolis from east to west and from north to south, and the drafting of a comprehensive building plan for the important streets and main roads leading out of London—a matter to which we have often drawn attention. The two great thoroughfares are suggested to be made 140ft. wide, the one—4½ miles long—connecting the Bayswater Road with Whitechapel, passing through the City near London Wall, and the other—4½ miles long—connecting Holloway with the Elephant and Castle, passing by a new bridge across the Thames near the western boundary of the City. It is proposed that there shall be four lines of tramways on the surface and four lines of railways a few feet below the surface; these latter, constituting shallow tramways, being regarded by the Commission as preferable to tube railways. The east and west thoroughfare is estimated to cost £15,550,000 and the north and south thoroughfare £8,550,000. The Commission recommend that new streets or widened streets should be laid out according to the following standard of width from house to house, depending upon their importance and the degree to which they are likely to attract traffic:—Main roads, 140ft.; first-class arterial streets 100ft.; second-class streets, 80ft.; third-class streets, 60ft.; fourth-class streets, 40ft. or 50ft. A viaduct is suggested to be formed over Ludgate Circus and another across the Strand at the foot of Wellington Street, while a sunken road is proposed under Piccadilly from Berkeley Street to St. James's Street.

Competitions.

Public Elementary School, Leigh, Lancs.—A short time ago the Leigh Corporation invited fourteen architects to send in designs for proposed elementary schools, and on the nomination of the president of the Royal Institute of British Architects, Mr. Mervyn Macartney was appointed assessor. He made his award as follows:—1st, Mr. J. C. Prestwich, of Leigh; 2nd, Mr. Thornley, of Wigan and Darwen; 3rd, Messrs. Potts, Son & Hennings, of Manchester and Bolton. The estimated cost of the schools is £9,000 and the accommodation is for 900 children.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Book on Quantities.

MANCHESTER.—QUANTITIES writes: "Please name a good book on the above. Is the examiner in quantities, City and Guilds of London Institute, the author of a book on the subject? Please give his address."

"Quantities and Quantity Taking," by W. E. Davis, 3s. 6d. post free from these offices. The examiner in quantities at the City and Guilds of London Institute is Mr. F. S. Henniker, who can be addressed at the Institute premises, Exhibition Road, South Kensington. So far as we know he is not the author of any book on quantities.

Contract Signing.

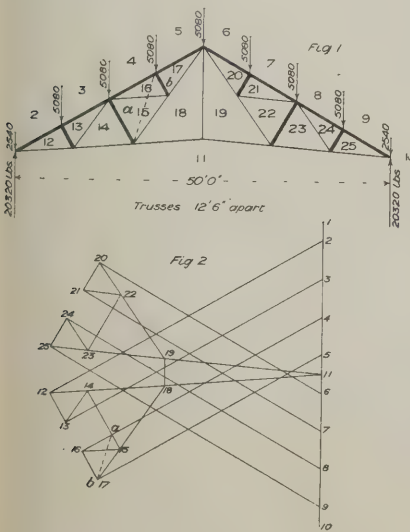
SALTERHEBBLE, HALIFAX.—DOUBTFUL writes: "If a partner, manager or other representative of a firm comes to sign a contract, is it sufficient and binding on his firm if he signs the name of the firm he represents; if not, what additional precaution should be taken?"

The signature of a partner will bind his firm, but not the signature of a manager or other representative unless specially authorized to sign contracts. F. S. I.

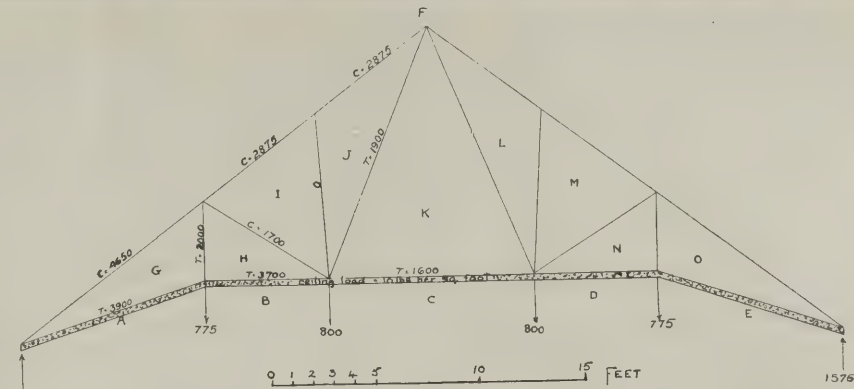
Stresses on Roof Truss.

LONDON.—A REGULAR READER writes: "Please give a stress diagram for the truss shown by the accompanying drawing."

The frame diagram (Fig. 1) and stress diagram (Fig. 2) are for vertical loading, with an allowance of 56 lbs. per ft. super. for total load. For a roof of this character it is quite sufficient to consider vertical loading only, but the action of the wind on one side will be found fully discussed and the stresses worked out in the writer's "Wind-pressure on Roofs" (Spon, 6d.) This truss is one that presents some difficulty in the construction of the stress diagram, but by first using the



substituted member *a b* (Fig. 1) points *a* and *b* may be found in the stress diagram, when $4 - a$, $14 - a$, and $a - b$, $5 - b$ fix point 15 by continuation through *a*, and point 17 at *b*. HENRY ADAMS.



Stresses in Roof Truss due to Expanded Metal Ceiling.

H. G. V. O. writes: "I send tracing (re-drawn) showing a roof truss. I desire to know the stress in the various bars due to the weight of an expanded metal ceiling (10 lbs. per ft. super.) fixed to the tee-rod. Please show what are the loads at the joints, and give a lettered stress diagram showing the stress at the bars."

The stresses in the roof truss due to the weight of ceiling at 10 lbs. per sq. ft., principals being placed roft. apart, is shown on this page, together with a stress diagram showing how the stresses were obtained. It will be noticed that the stress in *i-j* is zero. *c* indicates compression and *t* tension. Stresses are given in lbs. These stresses do not include those due to roof load or wind load, nor bending caused by the weight of the ceiling. In dimensioning the members of the truss, stresses due to roof, wind and ceiling loads should be added together, and to this should also be added the stresses caused by bending, which will be found by the formula below. The sum of the stresses should not exceed $7\frac{1}{2}$ tons per sq. in. Fibre stress due to bending is $f = \frac{w \times L}{8 \times s}$, where *w*

is the uniformly distributed load on one member in lbs., *L* = length of member in inches, *s* = section modulus of the cross-section of the member in inches³. S. N.

Course of Art Study.

BRADFORD.—J. D. writes: "Which is the best school of art to which I could send a young lady to continue her studies? She has got as far advanced as the facilities of a small Northern town will carry her, and I should like your advice as to whether London or Paris is best, and the probable expenses which such a course of study would entail."

There are many excellent schools of art in London, such as the Royal Academy School, the Westminster, the Lambeth, the London County Council School of Arts and Crafts, and the Royal College of Art at South Kensington. At these instruction equal to that given in Paris is given, though of course there is an atmosphere around the Ecole des Beaux-Arts which does not exist in London. It is impossible to state the probable cost, as everything depends on the particular school you favour and the length of time to be occupied in studies. You should write to the principals at the schools of arts named above. You will find particulars in "The Year's Art" (3s. 6d.).

Firing of Brick Clay.

FILEY.—R. W. S. writes: "Kindly give some information, or name a book in which I can find it, as to the temperature required to reduce good brick clay and sand to a molten condition, and the density and strength of the compound."

It is impossible to give a precise answer to your question because one clay will melt at 1,800 degs. Fahr., while another will not melt at 2,800 degs. If you wish to have some clay tested as to fusibility we suggest that you send a sample to Professor Arnold, of the Technical College, Sheffield. The fee, we believe, is three guineas.

Covenant in Building Lease.

BIRMINGHAM.—SUBSCRIBER writes: "B and C (separate builders) take adjoining plots of land on lease from A (a freeholder). The lease of each contains a covenant that the lessee shall erect a certain number of houses the prime cost of each of which shall be not less than £300, exclusive of outbuildings. B builds and sells for £310 per house without 'improving' the ground rent, and yet makes a good bargain. The inference is that B has not complied with the above covenant, and the appearance of the houses tends to confirm this. The proof, however, is difficult. C adheres strictly to the letter of his covenant, and now experiences difficulty in selling his houses owing to the competition of B's houses. Has C any right of action against freeholder, or can he force the latter to call for an account from B to prove that the minimum has been expended?"

C has no remedy against B because there is no privity of contract existing between them, and unless A has agreed and covenanted with C that he will not allow any houses of a less value than £300 each to be built on B's plot he is not liable to C for anything that B does. If A has broken any promise in his agreement he is liable to C for damages sustained by C as a natural consequence of such breach. Let C look carefully into his agreement and correspondence to see whether A at any time promised that no houses of less value than £300 should be built on contiguous plots to his. If so, let him enquire again as to the position, stating the facts fully. S. P. J. M.

THE STATUTORY ENROLMENT OF ARCHITECTS.

Draft Bill of the Institute.

THE Registration Committee of the Royal Institute of British Architects has just issued its report and draft Bill for the Statutory Enrolment of Architects, given in full in the Institute "Journal" for July 22nd. This committee, consisting of the council of the Institute and representatives of the allied societies, was appointed in January last year, and a sub-committee in October last. In its report the committee recommends that the Institute examinations should be made compulsory on all intending architects, and the Bill has been drafted (by the solicitors to the Institute, and settled by Mr. Cripps, K.C., and Mr. Clode) with that object in view.

In the matters of architectural training and education it is suggested that the scheme of the Board of Architectural Education might be taken as a guide for any further steps contemplated by the Institute.

The Objects of the Bill

are as follows:—

(a) To enable persons requiring professional aid in the design and construction of buildings to distinguish qualified from unqualified practitioners, and to prevent untrained and incompetent persons, styling themselves architects, from imposing on the community to its material loss, danger and detriment.

(b) To confine the use of the title "architect" to persons enrolled under the provisions of the Bill, and also to provide for the maintenance of a register of all such qualified persons.

(c) To create an Administrative Board of Architects, composed of the council of the Institute, representatives of the societies of architects other than the Institute, and also representatives (not exceeding ten) of universities, institutes and other bodies which the Privy Council may determine to be entitled to representation; such Board to regulate the conduct of examinations, the issue and cancellation of certificates, and the removal or restoration of names from and to the register, and generally to exercise disciplinary power over all architects with the object of promoting their efficiency and usefulness: any rules framed by the Board to be valid only if approved by the Privy Council.

The promoters point out that they do not limit or in any way affect the right of those persons practising as surveyors or as builders from exercising their respective callings in as ample a manner as heretofore, so long as they do not use the title of "architect."

The Bill is divided into twenty-two clauses.

When Enrolment Begins.

Clause 1 sets out that after July 1st, 1907, no person shall describe himself as an architect, whether by advertisement, by description on his place of business, by any document issued by him, or otherwise, unless he is enrolled: and further enacts that anyone describing himself as, or inducing people to believe he is, an architect without being enrolled is liable to a fine not exceeding £20 and to be restrained by injunction or interdict from continuing to use the term "architect." Partnerships societies or other associations of persons carrying on business under a common name, whether corporate or incorporate, are not to be entitled to be enrolled.

Provision for Persons now Qualified.

Clause 2 enacts that any person who within one year from the date of the Act coming into operation claims to be enrolled shall be so enrolled, provided—

(a) He is either a Fellow or an Associate of the Institute, or, being a member of any one of the allied societies, or of the Society of Architects, or of the Ulster Society of Architects, was at the passing of the Act in *bonâ-fide* practice as an architect; or

(b) Has obtained by examination and holds a degree in architecture conferred by any university within the United Kingdom, or has such other qualification as may be approved by the Board; or

(c) Proves to the satisfaction of the Board that at the passing of the Act he had been for at least two years engaged as a principal in the *bonâ-fide* practice of architecture, or

had served for ten years as pupil, apprentice or assistant, or partly as one and partly as the other, to a person or persons who at the passing of the Act is or are entitled to be enrolled.

Qualifying Examination for Enrolment.

Clause 3 enacts that subject to the provisions of clause 2 no person shall be entitled to be enrolled as an architect unless he has served as apprentice or assistant, or partly as one and partly as the other, for not less than five years with a person enrolled or entitled at the passing of the Act to be enrolled, and has passed and produces to the registrar a certificate under the seal of the Board that he has passed such examinations as to his knowledge of architecture and of the practice and duties of an architect as the Board shall from time to time prescribe: provided always that any person who has passed all the examinations required to be passed for membership of the Institute shall, subject to the provisions of the Act, be entitled to enrolment without further examination.

Constitution of Administrative Board.

Clause 4 states that after the passing of the Act, and notwithstanding anything contained in any charter or by-law of the Institute, there shall be added in each year to the council only one person if nominated by the Royal Institute of the Architects of Ireland, one person if nominated by the Architectural Association of London, one person if nominated by the Society of Architects, one person if nominated by the Ulster Society of Architects, the presidents of such of the allied societies as may not for the time being be represented upon the council, and such other persons (not exceeding ten in number) as may be nominated by any such universities, institutes, societies, associations and bodies (other than the Institute and allied societies) as the Privy Council shall from time to time determine to be entitled to representation: any vacancy occurring by resignation or death amongst the persons nominated under the foregoing provisions to be filled up by the body nominating such person, and the original and any subsequent nominees, at the termination of the period for which they have been appointed, to be eligible to be renominated.

Duties of Administrative Board.

Clause 5 states that the council and the persons added thereto under the provisions of clause 4 shall together form the Administrative Board of Architecture; and sets forth their duties and powers, which embrace the course of training, the subjects for examination, the issue of certificates, &c., and the removal from the roll of anyone contravening the provisions of the Act, and also the restoration to the roll of any architect so removed.

The Roll.

Clauses 6, 7, 8 and 9 relate to the keeping, by a registrar, of the roll of architects, which is to be published every year on or before January 31st (in 1907 at as early a date as possible). Clause 10 enacts that the Board may direct the registrar not to enrol any person who is proved to have been convicted of any offence which if committed in England would be a felony or misdemeanour, to have been declared by any court of competent jurisdiction to have committed any fraud, or to have been guilty of disgraceful professional conduct: provided that one month's notice be given to the person charged, so as to give him an opportunity of defending himself.

Removal of Names.

Clause 11 enacts that the registrar shall remove a name from the roll (a) at the request or with the consent of the person whose name is removed, (b) when the enrolled person is dead, or (c) when required so to do by the Board; and shall from time to time insert in the roll any alteration which may come to

his knowledge in the name or address of any person enrolled.

By clause 12 it is enacted that the Board may direct the registrar to remove a name from the roll when it has been incorrectly or fraudulently entered; when the person enrolled shall be convicted of felony, misdemeanour, fraud or disgraceful professional conduct (as in clause 10); or when the person enrolled enters into any other business or occupation not in the opinion of the Board incident to or consistent with that of an architect: provided always that one month's notice is given as in clause 10.

Appeal

from the decision of the Board is provided to be made (clause 13) to the High Court of Justice within three months after the notification of such decision; but no further appeal.

Clause 14 makes provision for the restoration of names removed from the roll, this being at the discretion of the Board, and either with or without the payment of a fee, as the Board shall decide.

The Fees

to be paid are spoken of in clause 15 as "such reasonable fees . . . as the Privy Council may from time to time . . . direct and fix, with a view to meeting the expenses incurred by the Board and the Institute in the administration of this Act." A schedule of fees is appended to the Bill as follows:—

Nature of Fee.	When to be Paid.	To whom to be Paid.
For enrolment of name of architect under provisions of section 2.	On application and before enrolment.	To the registrar of the Institute.
For enrolment of name of any person other than as above.	Ditto.	Ditto.
Annual fee to be paid by every enrolled architect taking out a practising certificate.	On or before November 30th of each year in respect of the year commencing January 1st following.	Ditto.
On entry of any candidate for final qualifying examination.	At time of entering	Ditto.
On entry of any candidate for any examination other than as above.	Ditto.	Ditto.

Clause 16 enacts for what purposes the fees are to be used, these purposes being as stated in clause 15 and "in promoting and facilitating the acquirement of the knowledge of such of the various arts and sciences connected with civil architecture as the Institute may from time to time determine."

A financial statement showing the receipts and expenditure, including liabilities, of the Board and the Institute under this Act is directed to be published as soon as possible after December 31st every year.

Clauses 17 and 18 specify penalties for making, or helping to make, false representation or declaration in obtaining a certificate of enrolment, such action being punishable by imprisonment not exceeding twelve months.

Scale Fees.

Clause 19 sets forth that from the date of the Act coming into operation the charges for professional services to be made by enrolled architects are to be those to be comprised in a schedule to the Act, or such other scale of charges as may be sanctioned by the Privy Council, and no persons other than those enrolled and holding practising certificates are to be entitled to practise as architects or to recover the above or any charges for services rendered in the capacity of architects: "provided that nothing herein contained shall prejudice the right of professional members of the Institution of Civil Engineers or Surveyors' Institution to recover charges for

work of any kind falling within the duties of their respective callings."

Clause 20 states that the Act is not to apply to naval architects; clause 21 defines the terms "council," "Institute," "allied societies," "architect" and "Board"; and the last clause, 22, gives the title of the Act, which may be cited as the Architects' Act, 1906, to come into operation on July 1st, 1907.

THE CHEAP COTTAGES EXHIBITION.

YESTERDAY the Cheap Cottages Exhibition at Letchworth (Garden City) was opened by the Duke of Devonshire. As our readers no doubt are aware, this exhibition is the outcome of a suggestion made by Mr. J. St. Loe Strachey, editor of the "Spectator" and proprietor of the "County Gentleman," who published a series of articles on the subject, and afterwards had the gratifying offer from the First Garden City, Ltd., of a site on which cottages could be built without being subjected to unduly stringent by-laws, and which, moreover, might not have to be pulled down at the close of the exhibition. Great interest has been evinced in the scheme, and to-day there is the collection of cheap houses to be seen on the estate at Letchworth. Next week we hope to give some photographs and plans of the most interesting of these, but meanwhile we may state a few particulars.

The Prizes Offered.

The primary object of the exhibition is to secure the erection of the best £150 cottage, and a first prize of £100 is offered for this exhibit. It was desired that the cottages should be detached and provided with one living-room and scullery, or kitchen-scullery, and three bedrooms (provided with two fire-places) having a cubic space of 2,000ft.—the rooms to be not less than 7ft. 6ins. high.

Other prizes offered are for the best pair of five-roomed cottages (including scullery or kitchen-scullery) erected at a cost not exceeding £300; for the best group of three or four cottages, no one cottage to contain more than six rooms, including scullery, and erected at a cost not exceeding £35 per room; for the best detached cottage or pair of cottages, each containing not more than six rooms, including scullery, and erected also at a cost not exceeding £35 per room: the estimated cost in every case to be exclusive of architect's fee and builder's profit.

Prizes are also offered for the best design and specification for a detached labourer's cottage costing not more than £150; a pair of five-roomed cottages costing not more than £300; a group of three or four cottages, no cottage containing more than six rooms (including scullery), costing not more than £35 per room; and a detached cottage or pair of cottages, each containing not more than six rooms (including scullery) and costing not more than £35 per room.

A prize of £100 (given by an anonymous donor) is also offered for the cheapest cottage in the exhibition, the judges having discretion as to the compatibility of cheapness with soundness of building and suitability for a rural labourer and his family; a prize of £50 (given by the Associated Portland Cement Manufacturers, Ltd.) for the best cottage built of cement-concrete; a prize of £50 for the best wooden cottage; a special prize of £10 (given by Mr. H. G. Elwes, F.R.S.) for the best design and specification of a wooden cottage to be constructed entirely of English timber; and a special prize of £10 (given by the Co-operative Small Holdings Society) for the best model of a small holding.

Prizes are also offered for the best invention or improvement in building materials and fittings calculated to improve, cheapen or facilitate the erection of cottage property.

Among the cottages erected are some by

the following architects:—Geoffrey Lucas, C. M. Crickmer, Henman & Cooper, C. S. Ingham, Percy Houghton, Stanley Barrett & Driver, Lionel F. Crane, H. Cayley, Richard Whitbread, Bennett & Bidwell, Harry Prince, Allen Foxley, Curtis Green, C. G. Agate, W. Moss Settle, Harrison & Hattrell, V. Dunkerley, Baker & May, George E. Clare, W. Taprell Allen, Baillie Scott, John A. Brodie, Hesketh & Stokes, R. Johnston, T. H. James, A. Randall Wells, F. W. Troup, Smith & Brewer, W. Marshall and Miss E. McClellan (for the Society of Artists).

In addition there are cottages by numerous builders and—

J. A. King & Co.	Concrete Machinery Co., Ltd.
British Uralite Co., Ltd.	Wire-weave Roofing Co.
Fireproof Partition and Spandrel Wall Co.	British Metallic Roofing and Constructional Co.
Asbestos Brick & Tile Co., Ltd.	Potter & Co., Ltd.
New Expanded Metal Co., Ltd.	John McManus.
	Cement Products Co.

The judges of the exhibition are Sir Walter Lawrence, Mr. Thackeray Turner, Prof. W. R. Lethaby, Mr. R. Weir Schultz, Miss Octavia Hill, Miss Yorke and Prof. Sims Woodhead (sanitary).

How to get to the Exhibition.

For the convenience of readers who wish to visit the exhibition we may state that the Great Northern Railway Co. issue return tickets at 2s. 6d. third class (including entrance to the exhibition) from King's Cross. Trains leave King's Cross at 9.0, 11.10, 3.10 and 6.18, and trains leave Letchworth at 8.33, 10.19, 2.28, 4.57, 7.0 and 7.31. About fifty-five minutes is occupied by the journey each way.

Keystones.

A new Mortuary at Newport is to be erected opposite the rear of the town hall.

Mr. John W. Simpson, F.R.I.B.A., and Mr. Maxwell Ayrton, A.R.I.B.A., have been appointed architects to the Royal Society of Painters in Water-colour.

Taunton School: London Old Boys' Club.

—An up-river trip has been arranged for Saturday, August 12th, leaving Paddington at 1.50. The price of tickets (inclusive) is 8s. each. Applications must be made on or before July 29th to the secretaries at 28, Princes Avenue, Church End, Finchley, N.

The Usher Hall still under discussion.—The Lord Provost's Committee of the Edinburgh Town Council resolved last Wednesday that a special meeting of the town council should be summoned for September 5th, when the whole question of the Usher Hall would be considered.

Northern Architectural Association.—Mr. Archibald Dunn, J.P., past-president, of Bournemouth, has sent Mr. Arthur Plummer, the hon. secretary of this Association, a cheque for £50 towards the Permanent Premises Fund. The alterations and improvements to the new premises of the Association in Higham Place have been satisfactorily completed.

Sixteen Municipal Cottages built at a cost of less than £150 each have been opened at Southwold. Each house contains three bedrooms, a living-room and kitchen, with garden at the back. They are of red brick, with red tile roofs, and are fitted up with larder, coal store and two cupboards. The contract price for the sixteen houses was £2,395. The rent is to be 4s. weekly.

The new Municipal Buildings at Crewe were opened last week. They occupy a site adjoining the Market Hall in Earle Street. The front is of fine white stone, and over the principal entrance are figures representing the advance of shipping and commerce, mechanics (especially with regard to engine building), and the textile and chemical industries. The approximate cost of the buildings is £20,000. Mr. Henry T. Hare, F.R.I.B.A., was the architect.

Deptford's new Town Hall is of Portland stone throughout, and has a striking façade carrying a frieze depicting a naval battle. Nautical emblems are carved all about the building, which is surmounted by a clock tower. The council-chamber is on the first floor at the front; while at the back and underneath, ranged round a fine pillared hall, are the various offices of the Corporation officials. The architects were Messrs. Lanchester & Rickards.

New District Baths for Bradford.—On Wednesday last two of the series of district baths in course of erection in various parts of Bradford were formerly opened. These serve the township of Bowling and are in Leeds Road and Wakefield Road. Both have been designed by the city architect, Mr. F. E. P. Edwards, A.R.I.B.A. The cost of the Leeds Road baths has been £7,934 (including £1,123 for the site) and the Wakefield Road baths £7,000.

Messrs. J. G. White & Co., Ltd.—An issue of 5,000 six per cent. cumulative preference shares in this well-known firm of tramway and general engineering contractors is being made. Particulars will be found on p. xix of this issue. The company does not manufacture, but purchases its supplies in the open market. It is therefore very lightly capitalized and in the most favourable position for securing certain classes of remunerative contracts. An interesting and promising feature is the equal association of the company with Waring & Gillow, Ltd., in the Waring-White Building Co., Ltd.

A.A. Prizes.—The prizes in the Architectural Association day and evening continuation schools were awarded on Friday afternoon by the president, Mr. E. Guy Dawber, F.R.I.B.A. The following is a list of the prize-winners:—*First Year Awards.* Mr. E. Stanley Hall, book prize for first place in history and construction tests; Mr. V. C. Batalha Reis, A.A. sketch book for first place in freehand drawing tests; Mr. M. S. R. Adams, book prize for best work in studio during whole session; Mr. W. J. Jones, master's prize for essay. *Second Year Awards.* Mr. W. W. Scott-Moncrieff, travelling studentship awarded for studio work during session 1904-5, holiday work during three vacations, and general progress; Mr. F. T. W. Grant, extra studentship awarded for general excellence in studio and holiday work. Design placed first, Mr. F. T. W. Grant, end of session test, special prize offered by Mr. H. P. G. Maule, subject "A Village Hall," award made by Mr. E. Guy Dawber; bracketed second, Mr. A. G. Blackford, Mr. H. I. Merriman, Mr. W. W. Scott-Moncrieff; third, Mr. A. N. Peckham. Mr. H. I. Merriman, prize for studio work and excellence in draughtsmanship. *Evening Continuation School.* Book prize for general work, Mr. Arthur Walford; second place, book prize, Mr. J. K. Ground.

PUBLIC HEALTH CONGRESS.

DURING the past week a congress of the Royal Institute of Public Health has been held in London, at which a number of papers of interest to architects, surveyors and others have been read. So far as architects are concerned, perhaps the most interesting were those on the planning of schools, by Mr. E. R. Robson and Mr. T. J. Bailey (L.C.C.); those on ventilation by Mr. J. H. Blizard and Mr. E. G. Rivers (chief engineer, H.M. Office of Works); and one or two on smoke abatement. We have reports of these papers in hand, but regret that owing to pressure on our space we are obliged to hold them over till next week, when we hope to give also a summary of some other papers read at the Congress.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
July 27	Prestwich—Wall	Guardians	T. Worthington & Son, 66 Brown Street, Prestwich.
" 28	Birmingham—Depôt	Corporation	Harris & Harris, 9 Bennett's Hill, Birmingham.
" 28	Pontypool—Chapel	Urban District Council	D. J. Lougher, Bank Chambers, Pontypool.
" 28	Walsall—School	Education Committee	Bailey & McConall, Bridge Street, Walsall.
" 28	Pontnewynydd, near Pontypool—Villa	Mr. J. Amery	D. J. Lougher, Bank Chambers, Pontypool.
" 28	Normanby—House	Dr. Townsend	R. Lofthouse & Sons, 62 Albert Road, Middlesbrough.
" 29	Lincoln—School	Governors	E. C. Pinks, Parliament Mansions, Victoria Street, S.W.
" 29	Rathfriland—Renovation of Church	Industrial Co-op. Society	D. Murphy, Newry Street, Rathfriland.
" 29	Widnes—Premises	Visiting Committee	Society's Offices, 406 Church Street, Runcorn.
" 29	Cardigan—House, &c.	Guardians	Vale of Teivy Co-operative Society's Stores, Cardigan.
" 29	Newcastle-on-Tyne—Alterations to Kitchens, &c.	Guardians	City Property Surveyor's Department, Town Hall, Newcastle-on-Tyne.
" 29	Stockton-on-Tees—Alterations to Laundry	Guardians	J. Rodham, 16 Finkle Street, Stockton-on-Tees.
" 29	Bradford—Conversion of Hospital Block into Infirmary Block.	Guardians	F. Holland, 11 Parkinson's Chambers, Hustlergate, Bradford.
" 29	Cilgerran, Wales—Repairs at School	Education Committee	J. Williams, Gwynfryn House, Cilgerran.
" 29	Weston-super-Mare—Additions to School	Education Committee	Samson & Cottam, 43 High Street, Bridgwater.
" 29	East Coker—Classroom, &c.	Education Committee	A. J. Pictou, Bruton, Somerset.
" 31	Keighley—Alteration to School	Urban District Council	J. Vickers-Edwards, County Hall, Wakefield.
" 31	Barry—Hospital	Guardians	J. C. Pardoe, 160 Holton Road, Barry.
" 31	Dudley—Conversion of Washhouse into Ward	Education Committee	A. Marshall, King Street, Nottingham.
" 31	Newcastle—School	Guardians	County Surveyor's Office, Moothall, Newcastle.
" 31	Tattingstone, Suffolk—Repairing Exterior of Workhouse	Education Committee	A. J. Haward, Princes Street, Ipswich.
" 31	Silsden, near Keighley—Additions to School	Education Committee	Education Offices, County Hall, Wakefield.
" 31	Stepney, E.—Extension of Library	Council	M. W. Jameson, 15 Great Alie Street, Whitechapel, E.
" 31	Emyvale, Monaghan—Dispensary	Guardians	W. A. Scott, 74 Holly Bank Road, Drumcondra.
Aug. 1	Ballymoney—Technical School	Governors	J. A. Hanna, Ocean Building, Belfast.
" 1	Buckingham—New Royal Latin School	Education Committee	Town Hall, Buckingham.
" 1	Carlisle—School Buildings	Guardians	A. H. Collingwood, 15 Fisher Street, Carlisle.
" 1	Ulverston—Alterations to Hospital	Commissioners	Cottage Hospital, Ulverston.
" 2	Dublin—Residence and Dispensary	Commissioners	J. O'Neill, Clerk's Office, North Brunswick Street, Dublin.
" 2	Paddington, W.—Extension of Laundry, &c.	Commissioners	F. J. Smith, Parliament Mansions, Victoria Street.
" 3	Crieff, N.B.—Post-office	Commissioners	Postmaster, Crieff.
" 4	London, E.—Additions at Shoreditch County Court	Fish Oil & Guano Co.	J. B. Westcott, H.M. Office of Works, Storey's Gate.
" 4	Southwold—Sea Defence Works	Education Committee	E. R. Cooper, Town Clerk, Southwold.
" 4	Bonnybrake, N.B.—Works	Town Council	Carmichael & Sharman, 12 Queen Street, Edinburgh.
" 4	Nantymoel—Alteration to Chapel	Guardians	W. B. Rees, 3 Dumfries Place, Cardiff.
" 5	St. Erme, Cornwall—Piggery, &c.	Education Committee	Farmhouse, Tregasson, St. Erme.
" 5	Sheffield—School	Town Council	Secretary, Education Committee, Education Offices, Sheffield.
" 7	Partick—Fire-brigade Station	Guardians	J. Miller, 15 Blythswood Square, Glasgow.
" 8	Newton Abbot—Nursery	Education Committee	S. Segar, Union Street, Newton Abbot.
" 9	Dungarvan, Ireland—Cells, &c.	Corporation	Office of Public Works, Dublin.
" 12	Wallsall Wood, Staffs—School	Urban District Council	G. Balfour, Director of Education, Stafford.
" 12	Ryde, Isle of Wight—Cottages	Guardians	Borough Engineer, Town Hall, Ryde.
" 15	Hampton, Middlesex—Fire-station, &c.	Urban District Council	S. H. Chambers, Public Offices, Hampton.
" 16	Barnet, Herts—Additions to Workhouse	Guardians	White, Son & Pill, 13 High Street, Barnet.
" 16	Fernhurst, near Haslemere—House	J. Caesar	M. Childs, Bridgeland, Fernhurst.
ENGINEERING:			
July 27	Ladywell, Berwickshire—Pump, &c.	Urban District Council	J. & A. Leslie & Reid, 72A George Street, Edinburgh.
" 28	Portland, Dorset—Tar Washer	Rural District Council	Corbet Woodall & Son, Palace Chambers, Westminster, S.W.
" 28	Chelmsford—Laying Pipes	Corporation	J. Dewhurst, Avenue Chambers, Chelmsford.
" 28	Hull—Supply and Fixing of Constructional Steelwork	Education Committee	City Architect, Town Hall, Hull.
" 29	Lydbrook—Culvert	Corporation	M. H. Medland, 15 Clarence Street, Gloucester.
" 31	Stockport—Waterworks	Great S. & W. Ry. Co., Ltd.	E. Mansergh, 5 Victoria Street, Westminster, S.W.
Aug. 1	Waterford—Railway Station	Corporation	Office of Company's Engineer, Inchicore, Dublin.
" 2	Cardiff—Sewers	Urban District Council	W. Harper, Borough Engineer, Cardiff.
" 5	Ipswich—Boiler	Gas Committee	R. J. Kent, 19 Tower Street, Ipswich.
" 5	Ebbw Vale, Mon.—Cables	Urban District Council	R. P. Wilson, 66 Victoria Street, S.W.
" 9	Belfast—Gas Cookers	Gas Committee	Sir S. Black, Town Clerk, Belfast.
" 12	Bishop's Stortford—Pumping Engine	Urban District Council	T. Swatheridge, Council Offices, 7 North Street, Bishop's Stortford.
" 14	Appleby, Lincs—Reservoir	Urban District Council	A. Atkinson, Brigg.
" 14	Carlisle—Reservoir	Corporation	J. Mansergh & Sons, 5, Victoria Street, S.W.
" 14	Skipton—Reservoir	Urban District Council	G. H. Hill & Sons, 3 Victoria Street, S.W.
Sept. 1	Merthyr Tydfil—Destructor Plant	Urban District Council	T. F. Harvey, Town Hall, Merthyr.
Oct. 23	Wolverhampton—Pumping Engine	Corporation	E. A. B. Woodward, Town Hall, Wolverhampton.
" 23	Mussoorie, India—Electric Lighting and Waterworks Scheme.	Municipality	C. H. Shanahan, Municipal Office, Mussoorie, India.
IRON AND STEEL:			
July 27	Belfast—Castings	Gas Committee	Gasworks, Belfast.
" 29	Washington, U.S.A.—Copper Wire, &c.	Isthmian Canal Commission	General Purchasing Officer, Washington.
" 29	Christiania—Tubes	Commercial Intelligence Branch of Board of Trade.	Office of Commercial Intelligence Branch of Board of Trade.
Aug. 31	Sevenoaks—Iron Fencing	Urban District Council	S. Towson, Surveyor, Sevenoaks.
" 2	Amsterdam—Ironwork, &c.	Commercial Intelligence Branch of Board of Trade.	M. Mart. Nighoff, Bookseller, The Hague.
" 15	Callao—Piping	Corporation	Graham, Rowse & Co., Mersey Chambers, Liverpool.
Oct. 9	Mussoorie, India—Pipes, &c.	Municipal Board	C. H. Shanahan, Municipal Office, Mussoorie.
PAINTING AND PLUMBING:			
July 29	Dudley—Oils	Corporation	R. P. Wilson, 66 Victoria Street, S.W.
" 29	Bradford—Painting Work	Guardians	F. Holland, 11 Parkinson's Chambers, Hustlergate, Bradford.
" 31	Samford—Painting Exterior of Workhouse	Guardians	Clerk, Workhouse, Samford.
Aug. 2	Glasgow—Painting at Police Offices, &c.	Corporation	Office of Public Works, 64 Cochrane Street, Belfast.
" 28	Gateshead—Cleaning and Painting at Schools	Education Committee	E. J. Harding, Education Offices, Gateshead.
ROADS AND CARTAGE:			
July 27	Gateshead—Paving	Urban District Council	N. P. Patterson, Town Hall, Gateshead.
" 28	Ashford, Kent—Road Works	Corporation	William Terrill, Surveyor, Ashford.
" 29	Bradford—Granite Setts	Urban District Council	J. H. Cox, Town Hall, Bradford.
" 29	Ellesmere Port—Making-up Roads	Urban District Council	J. M. Hudson, Bank Building, Ellesmere.
" 31	Prestwich—Street Works	Urban District Council	Surveyor's Office, Chester Bank, Prestwich.
" 31	Cheriton, Kent—Tar-paving	Urban District Council	Surveyor's Office, Public Offices, Cheriton.
" 31	East Dereham—Granite	Urban District Council	H. G. Himson, Theatre Street, East Dereham.
" 31	Droxford, Hants—Steam Rolling	Rural District Council	F. Clarke, Bishop's Waltham.
Aug. 1	London, N.—Making-up Roads	Tottenham U.D.C.	W. H. Prescott, Coombes Croft House, 712, High Road, Tottenham.
" 2	Hove, Sussex—Paving Works	Urban District Council	H. H. Scott, Borough Surveyor, Hove.
" 7	Ebbw Vale, Mon.—Road Improvement	Urban District Council	T. J. Thomas, Surveyor, Ebbw Vale.
SANITARY:			
July 31	Axbridge—Sewerage Works	Rural District Council	A. Powell, 10, Orchard Street, College Green, Bristol.
" 31	Hawarden, Flint—Sewerage Works	Rural District Council	E. S. Taylor, 26, Newgate Street, Chester.
Aug. 1	Arnold, Notts—Drains	Urban District Council	R. E. Clarke, Public Offices, Arnold.
" 7	Galston, N.B.—Sewage-disposal Works	Town Council	Office of Master of Works, Galston.
TIMBER:			
July 28	London, S.E.—Oak Fencing	London County Council	Parks Department, 11, Regent Street, S.W.
Aug. 1	Southampton—Boxwood Plotting Scales	Ordnance Survey	Officer in-Charge of Stores, Ordnance Survey Office, Southampton
" 15	Canterbury—Oak Fencing	Sanatorium Committee	A. C. Turley, City Surveyor, Canterbury.

Trade and Craft.

Stained-Glass, Casements, &c.

We have received from Messrs. Abbott & Co., of St. John's Studio, Lancaster, a well-illustrated catalogue of stained- and leaded-glass windows, memorial brasses, casements and frames, and cast leadwork, &c. As in other branches of design, a great change has been effected in respect to stained-glass windows, and we see a greater appreciation of the purely decorative treatment both in figure and floral subjects. A number of the designs in this catalogue are reproduced in colour and show to good advantage. They are carefully worked out, and the plainer designs especially are very pleasing. Some fine drawings are given of a series of four windows depicting "The Woman of Samaria" erected in a church at Blackburn, and six others out of a series of fifteen erected at a church near Lytham; these latter representing Tyndale, Bunyan, Savonarola, Cromwell, Milton and Barrowe. In the execution of these windows only the finest and richest English Antique glass is used, and this secures the best results in the hands of skilled artists and colourists. Messrs. Abbott say they are always pleased to produce special designs for proposed windows, and where necessary will send a representative to interview intending donors or committees and give advice as to the most suitable subject and colour scheme. As it is of considerable convenience to architects, builders and others to be able to place in the hands of one firm the making of the window frames, casements, &c., as well as the stained or leaded glass with which they are to be filled, Messrs. Abbott have recently added this branch to their business, and a variety of sections for such frames and casements are given in their catalogue. The leadwork executed by them is represented

by a number of rainwater pipe-heads, ears, &c., several of which are of very good design.

The Plenum System.

It is generally admitted that Mr. W. Key was the first in this country to employ the plenum system of ventilation and warming on a commercial scale. More dispute, perhaps, has centred around the problems of ventilation than around any other subject connected with building, but in recent years especially it has become to be recognized that for the ventilation of a building occupied by a large number of persons the plenum system is the only one by which efficiency can be guaranteed. It relies upon mechanical means for its working, and as these mechanical means are under exact control a predetermined result can be obtained. Mr. Key (whose Glasgow address is 109, Hope Street, and London address 11, Queen Victoria Street) sends us a little pamphlet dealing with his system which is of interest to architects and others.

Builders' Notes.

The Dispute at Newcastle between the Master-Builders' Association and the Operative Bricklayers' Society still continues, the masters adhering to their proposals as to wages, apprentices, arbitration, overtime, &c.

Building in the United States continues active all over the country. The average increase over last year, which was itself a great year for building operations, is ranging from 25 to 30 per cent., or in money-figures the increase represents £340,000 to £400,000 per month in twenty-five of the principal cities of the States. The total volume of construction now under progress in the country represents no less a sum than £3,000,000 per month for the present building season.

At Kirton Grammar School, Lincolnshire, new heating apparatus has been supplied and fixed by Messrs. Sheen & Mills, of Bath Street Ironworks, Sheffield.

The Sanitary Inspectors' Association will hold its annual meeting and conference at the Carpenters' Hall, London Wall, E.C., from August 17th to 19th inclusive.

House Building at Blackpool.—In welcoming the members of the National Federation of Building Trades' Employers of Great Britain and Ireland, who held their summer meetings at Blackpool recently, the mayor (Alderman J. Brodie, J.P.) made an interesting statement as to the rapid growth and development of the town during the past ten years. In 1895 there were 531 houses built, in 1896 there were 744, the following year 984, while in 1898 the highest figures were reached—1,066. They seemed to go back a little after that, but still they were progressing. In 1899 there were 483 houses erected, 429 in 1900, 370 in 1901, 383 in 1902, 311 in 1903, and in 1904-5 (to June 30th), 454, making a total of 5,755.

The Cardiff Building Trade Dispute seems likely to be settled. The hitch is over the interpretation of a minute relating to the time of starting work during two weeks of the year, one before and one after Christmas. The masters had stipulated in writing for half an hour for dinner, the intention being that the men should start at 7.30 during the two weeks in question. The men have now submitted their reply, which is to the effect that they consider the offer they accepted was an equitable one and should be observed in honour by the masters, but in the alternative they are ready to take the full dinner hour during this period so as not to increase the aggregate number of hours worked in the week. A joint conference is to be held.

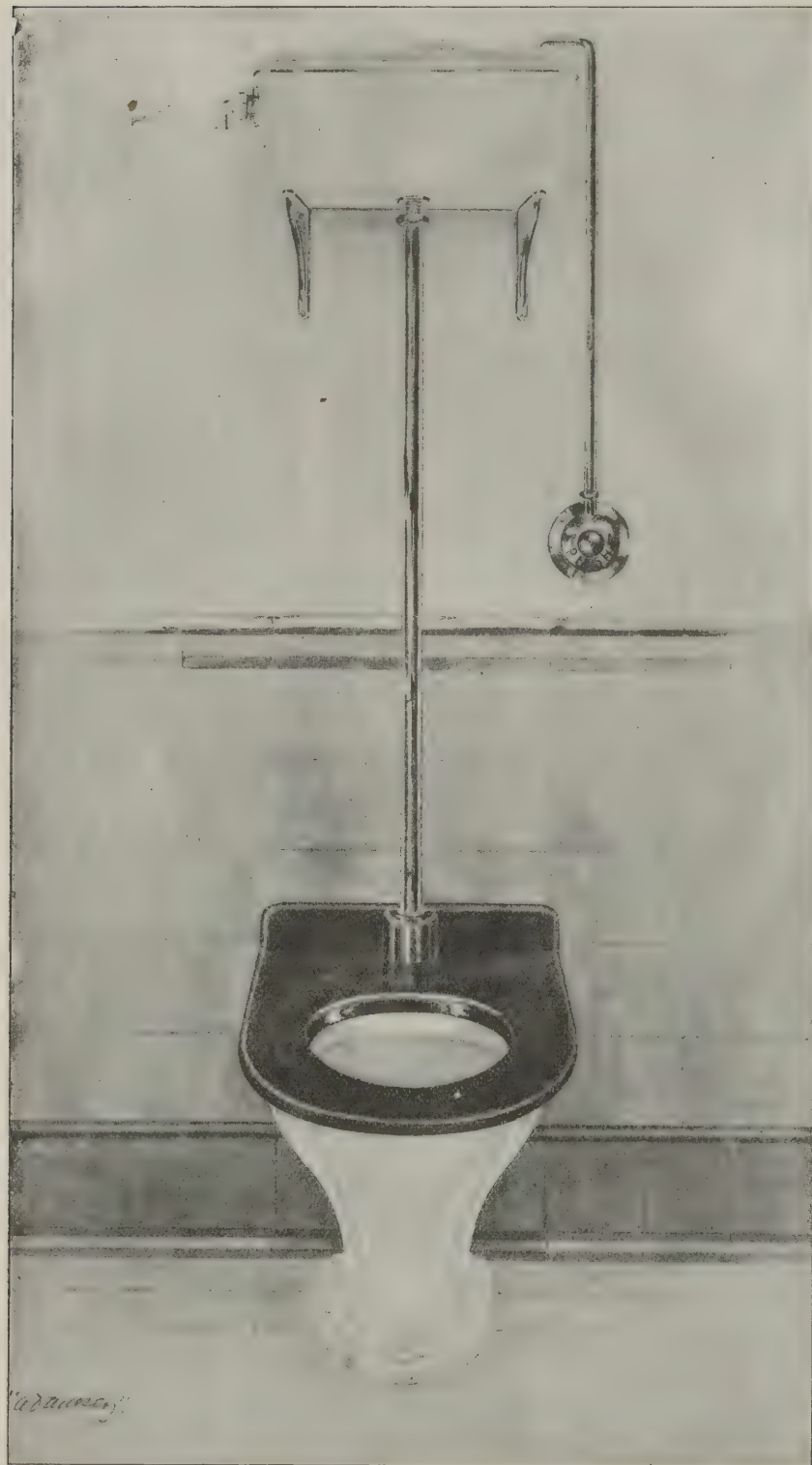


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List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
July 27	Bexhill, Sussex—School	£50, £30 and £20	£1 ts.	Secretary, Education Committee, Amherst Road, Bexhi'
Aug. 1	Hove, Sussex—Library	£50, £30, £20	£1 ts.	H. Endacott, Town Hall, Hove.
" 1	Perth—Reconstruction of Hall ..	30, 20 and 10 guineas	£1 ts.	J. Begg, City Chambers, Perth.
Sept. 3	Cheshunt—Library			A. C. Lee, Manor House, Cheshunt, Herts.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abertillery.—For altering and enlarging the chapel and school at the Trinity Presbyterian Church of Wales. Mr. R. S. Roberts, M.S.A., architect, Abercarn:—
J. Matthias, Newport £2,262 0 0
R. Tudor 2,105 0 0
D. W. Richards, Ltd., Newport ... 2,017 0 0
N. Bagley 1,995 18 3
Gaen Brothers 1,989 18 0
J. Charles, Newport 1,929 0 0
J. Jenkins, Newport 1,920 0 0
Skidmore & MacWhirter* 1,788 0 0
* Accepted. [Rest of Abertillery.]

Canwell (Staffs).—For structural alterations at the Hall, and for the erection and completion of a dairy with cottage on the Canwell Hall Estate, near Tamworth, Staffs, for Mr. Philip S. Foster, M.P. Mr. C. M. C. Armstrong, architect, 5, High Street, Warwick:—
Foster & Dicksee £1,259 0 0
J. Bowen & Son 1,248 0 0
J. Parnell & Son 1,221 17 0
J. Barnsley & Son 1,198 0 0
Collins & Godfrey 1,160 0 0
T. Broad & Co. 1,154 18 3
G. F. Smith & Sons 1,145 0 0
W. & J. Webb 1,125 0 0
F. Davis 1,097 0 0
G. Hodges 1,088 0 0
W. J. Whittall & Son, Birmingham 1,035 0 0
* Accepted.

Cardiff.—For the erection of new infants' department and additions to the boys' and girls' departments, new latrines, &c., at St. Mary's National Schools in Bute Terrace, for the Rev. Gilbert Heaton, M.A. Messrs. Veall & Sant, architects, Cardiff:—
Cox & Bardo £2,698 0 0
J. Allan & Son 2,661 15 0
J. Gibson 2,598 10 0
Shepton & Son 2,580 0 0
D. Davies 2,577 0 0
G. H. Elkington, Penarth 2,479 0 0
E. R. Evans & Brothers 2,426 0 0
G. Beames 2,398 0 0
F. Small 2,366 0 0
T. Bevan, Penarth 2,330 0 0
F. C. Williams 2,320 0 0
Knox & Wells 2,277 0 0
W. T. Morgan 2,275 0 0
Melhuish Brothers 2,248 0 0
W. Symonds & Co.* 2,218 0 0
* Accepted. [Rest of Cardiff.]

Chelmsford.—For the erection of two dwelling-houses. Mr. Alfred F. Ginn, architect, Tonbridge:—
F. Weight £1,450
F. Johnson 1,357
H. Potter & Son 1,165
A. Moss & Co. 985
J. Gowers* 960
* Accepted.

Croydon.—Accepted for re-drainage and plumbing work, &c., at the infirmary, Mayday Road, Thornton Heath, for the Guardians. Mr. H. Berney, surveyor, 104, George Street, Croydon:—
D. W. Barker, 52, Church Road ... £2,545
East Ham.—For the erection of shop and private house. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C.:—
J. T. Robey £918 0 0
T. Osborn & Sons 899 0 0
A. W. Derby 875 0 0
Clemens Brothers* 840 10 0
* Accepted.

Gainsborough.—For the erection of an elementary school, to accommodate 934 children, for the Lindsey Council Education Committee. Messrs. Scorer & Gamble, architects, Bank Street Chambers, Lincoln:—
F. M. Thompson & Son, Louth, Lincs £10,821 0 0
Pattinson & Sons, Ruskington, Sleaford 9,880 0 0
S. F. Halliday, Stamford 9,770 0 0
Maver Brothers, Louth, Lincs ... 9,725 15 4
J. Cracknell, Peterborough 9,715 0 0
Kettering Co-operative Builders ... 9,542 0 0
J. Cooper & Son, Nottingham ... 9,496 0 0
Oak Building Co., Cambridge ... 9,449 0 0
J. Guttridge, Peterborough 9,391 0 0
T. Cuthbert, Nottingham 9,370 0 0
J. Fidler, Sheffield 9,358 0 0
F. Messom, Nottingham 9,300 0 0
W. Scott, Gainsborough 9,271 0 0
D. Gill & Son, Doncaster 9,207 0 0
H. S. & W. Close, Lincoln 9,180 0 0
C. A. Leverton, Workop 9,082 0 0
W. H. Maxey & Son, Sleaford ... 8,980 0 0
C. Sprakes & Sons, Doncaster ... 8,975 0 0
F. Scarborough, Lincoln 8,764 0 0
F. Barlow & Co., Nottingham ... 8,750 0 0
J. Lewin, Netherfield, Notts 8,700 0 0
T. Fish & Son, Nottingham 8,591 0 0
C. Wright, Leicester 8,550 0 0
A. J. Elmes, Gainsborough 8,449 10 0
Salmon & Co., Cudworth, near Barnsley 8,444 11 0
H. Arnold & Son, Doncaster ... 8,150 0 4
W. Moss & Sons,* 39, Baxter Gate, Loughborough 7,860 0 0
* Accepted.

Llandilo.—Accepted for the erection of a vicarage, for the Rev. Robert Williams, M.A. Mr. D. Jenkins, architect, Llandilo:—
W. Evans, Brynawel, Ammanford ... £2,400
London, W.—For the erection of five shops in Askew Road, Hammersmith, for Mr. A. Gard. Mr. Jasper J. Kelf, architect, 213, Hoe Street, Walthamstow, and Leytonstone:—
Cromptley Brothers £5,500
S. W. Robinson 4,500
J. Reppen 3,590
Drummond 3,450
Wheeler,* Woodford 3,350
* Accepted.

London, S.W.—For the erection of a metalwork centre, &c., at Aristotle Road School, Clapham, for the London County Council Education Committee:—
Enness Brothers £1,350
F. & H. F. Higgs 1,343
R. A. Jewell 1,276

F. G. Minter £1,273
Lathey Brothers 1,271
W. Smith & Sons 1,251
J. Marsland & Sons 1,231
J. Smith & Sons 1,223
General Builders 1,188
Thompson & Beveridge 1,167
J. Appleby & Sons 1,167
T. D. Leng 1,135
E. Triggs 1,117
J. & M. Patrick 1,098
W. Johnson & Co. 1,076
Rice & Son 1,053
Turnbull & Son 1,039
J. Garrett & Son,* 17, Balham Hill ... 1,002
* Recommended for acceptance.

Mountain Ash.—For the erection of Welsh Calvinistic Methodist Chapel. Messrs. Morgan & Elford, architects:—
Davies & Sons £2,960
Jones Brothers* 2,950
T. W. Davies 2,898
* Accepted.

Sandwich (Kent).—For the erection of a great hall at Sir Roger Manwood's Grammar School. Mr. C. L. Crowther, architect, Queen Street, Deal:—
C. J. Howland, Hythe £1,965
Woodhall & Sons, Ramsgate 1,962
J. Brett, Sandwich 1,858
E. T. Turner, Sandwich 1,752
A. O. Ovenden, Sandwich 1,723
J. E. Turner, Walmer 1,670
A. W. Thompson, Walmer 1,530
W. Brenchley, Eastry 1,529
G. B. Cottew, Deal 1,479
E. Trevers, Deal 1,470
J. Hayward & Son, Deal 1,459
Huckell & Grimbly, Ramsgate ... 1,409
J. Forwalk, Ramsgate 1,388
Sturly Building Co., Sturry 1,377
S. & H. Jefford, Walmer 1,347
F. J. Court, St. Lawrence 1,337
G. H. Pettman, Birchington 1,329
J. J. Wise, Deal 1,326
T. T. Denne, Walmer 1,303
G. Browning, Canterbury 1,289
C. G. Townsend, Deal 1,230
Amos & Foad, Whitstable 1,229
G. Lewis & Son,* Dover 1,215
* Accepted.

Swindon.—For the alteration and enlargement of the Swindon and North Wilts Secondary School and Technical Institution, for the Education Committee. Mr. R. J. Beswick, architect, Victoria Road, Swindon:—
R. I. Leighfield £1,413
J. Williams 1,342
Tydeman Brothers 1,281
Norman 1,260
Spackman Brothers* 1,236
* Accepted. [All of Swindon.]

Teddington.—For alterations to Nos. 1 to 5, Elphin Villas, Broad Lane. Mr. Jasper J. Kelf, architect, 313, Hoe Street, Walthamstow, and Leytonstone:—
W. Rice & So £1,995 0 0
S. Smith 1,864 13 7
Jay & Co. 1,610 0 0
Robinson & Co. 1,400 0 0
Drummond,* Leytonstone 1,365 0 0
* Accepted.
(Continued on p. xvi.)

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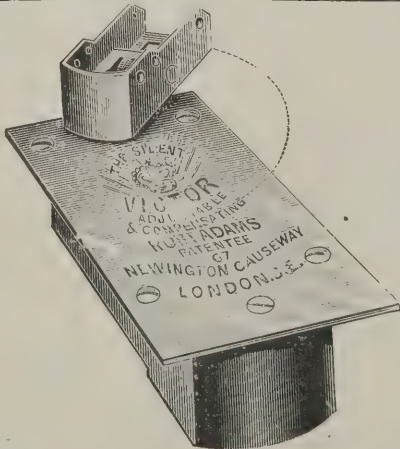
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ABLE ASSISTANT (24½) seeks RE-ENGAGEMENT. Careful draughtsman.—F. B. HOOPER, The Hermitage, High Wycombe.

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ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT, 3½ years' varied experience, able to prepare working drawings from rough sketches; surveying, levelling, &c.; moderate salary.—X., 48, Thornton Avenue, Chiswick, W. 1240

ARCHITECT and SURVEYOR'S experienced and capable all-round ASSISTANT desires permanency. Thoroughly well versed in quantities, working drawings, construction, steelwork, details, surveying and levelling. Moderate salary.—H., Preston Villa, Markenfield Road, Guildford. 1238

ARCHITECT'S ASSISTANT (24) desires ENGAGEMENT. Good draughtsman. Designs, working drawings, details, perspectives, specifications; nine years' experience.—W. H. L., 83, Elspeth Road, Clapham Common, S.W. 1210

ARCHITECT'S Junior ASSISTANT (22½) desires SITUATION. Excellent draughtsman, well up in construction, working drawings, measuring and plotting, specifications. Could assist with quantities. Six years' experience.—S. W. H., Brookdale, Manor Road, Teddington. 1263

ARCHITECTURAL ASSISTANT (26) wants POSITION in architect's (or engineer's) office. Seven years' experience. Working drawings and details, surveying, perspectives, etc.—A. E. P., 35, Carpenter Road, Edgbaston, Birmingham. 1189

ARCHITECT'S ASSISTANT (32). Experienced Draughtsman and Designer, specifications and quantities, 55s. Country preferred.—TRAHO, 186, Worple Road, Wimbledon. 1237

ARCHITECT'S ASSISTANT requires situation; contract drawings half and full size, details, surveying, &c., and general office work. Moderate salary.—Box 1232, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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BUILDER'S, &c. CLERK OF WORKS ASSISTANT (22); drawing, tracing, knowledge quantities and details; 4½ years in architect's office; certificates, building construction, advanced, 1st freehand, &c.—H. M. N., Thorncroft, Farnham, Surrey. 1243

CARPENTER and JOINER with 16 years' experience, wants piecework labour only or as working foreman; good references; distance no object; estimates given.—Apply, D. W., 58, Wellington Street, Gravesend, Kent. 1208

CLERK OF WORKS, good draughtsman, setter-out, sanitary engineering, quantities, seeks position as ASSISTANT; thoroughly practical, trustworthy, and reliable.—D., 9, Lambeth Palace Road, London, S.E. 1242

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GENERAL FOREMAN or MANAGER. 16 years' experience, age 31, trade carpenter and joiner, well up in quantities, estimating, drawing, &c.—Box 1267, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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GENERAL or WORKING FOREMAN (Carpenter). Building alterations, or sole charge, good jobbing. Good Manager of men. Practical experience in all branches.—W. A., 88, Siebert Road, Westcombe Park, S.E. 1227

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MACHINIST (Joiners), spindle, tenon, general joiner, moulding, machines, &c.; all-round hand; take charge and set out if required; good references and reliable.—JOINER 65, Fairfield Road, Bow, E. 1265

MACHINIST (24), spindle hand improver; can also work saw bench, band saw, overhead and panel planer; make cutters, sharpen saws.—MACHINIST, 18, Lausanne Road, Peckham, S.E. 1266

MACHINIST, YOUNG, seeks JOB as IMPROVER on Sawbench or Planer. Good Refs. Wages moderate. London preferred.—A. A., Brooklyn House, Bell Lane, Hendon, N.W. 1204

PAINTER.—Good all-round hand wants JOB, town or country. Abstainer.—A. R., 43, Bassett Street, Kentish Town, N.W. 1236

PAINTER.—WORKING FOREMAN desires ENGAGEMENT. Good all-round man in all branches of the trade. Refs.; abstainer.—F. R., 43, Bassett Street, Kentish Town, N.W. 1235

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PLUMBER.—Reliable Man REQUIRES JOB or CONTRACT for Sanitary Work.—W. PHILLIPS, 9, Selwood Street, Rotherhithe, S.E. 1209

QUANTITY SURVEYOR'S ASSISTANT (22). Working up, &c., also neat draughtsman. Moderate salary.—Box 1223, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

YOUNG ARCHITECT, 7 years' London and provincial experience, and passed part of R.I.B.A. Final, desires further London experience in designing and execution of buildings. Would accept position in good office without salary. 1264

Appointments Vacant.

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NORTHERN POLYTECHNIC INSTITUTE, Holloway, London, N.—The Governors of the above Institute invite applications for the following appointment:—CHIEF ASSISTANT in the Building Trades Department, salary £150. Applications to be made on special forms, which must be returned not later than 24th July, to be obtained from W. M. MACBETH, Secretary.

SURVEYOR (F.S.I.) requires PUPIL; small premium.—H. S. W., 94, Queen Street, Maidenhead.

YOUTH WANTED for Architect's London Office.—Address, with full particulars, Box 1226, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

Partnerships.

YOUNG ARCHITECT, 10 years' London and provincial experience, of artistic and practical ability, desires ENGAGEMENT with Architect with a view to purchasing Junior Partnership. Highest references from some of the most influential members of the profession. Speciality: Domestic work.—Apply, Box 1262, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECTURAL DRAUGHTSMAN desires to ASSIST during his spare time in the preparation of contract or competition drawings. Ten years' London experience. Moderate charges.—E. C., 100, Archway Road, N. 1205

DESIGNS for SUBURBAN RESIDENCES prepared to suit clients. Plans and Specifications for new work and alterations. Drain Plans at specially low fees.—J. LAWRENCE, jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W.

DRAWINGS from rough sketches, designs, details, specifications, drain plans and quantities prepared. Terms moderate.—J. W., 8, Rylett Crescent, Shepherd's Bush, W. 1241

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OLD-ESTABLISHED BUILDER and DECORATOR'S BUSINESS for SALE in Kensington neighbourhood. Turnover, average for past two years, £2,100. No agents.—Address, A. E. DAVIS, Chartered Accountant, 18, Ironmonger Lane, London, E.C.

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SHARE OF OFFICES.—An Architect with offices adjoining Bedford Row can accommodate another. Terms £18.—Box 1201, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

SHARE OF OFFICES.—Provincial Architect will share his City offices with Quantity Surveyor or another Architect.—Box 1225, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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MARBLE and GRANITE WORK. Speciality, Shopfittings, Steps, and Monuments.—KELLY & Co., Masons, Mill Hill, N.W., also Kilburn N.W., and Harpenden, &c. Telephone, 1159 Hampstead.

POLING BOARDS, selected lengths and thicknesses (best quality and full measure). Also Scaffold Boards, Putlogs, Scantlings, Deals, Battens and Boards. Lowest wharf prices. C. H. GLOVER & Co., Ltd., Importers, Hatcham Saw Mills, Old Kent Road, S.E.

SAWN OAK PARK PALING, 6 inches wide, 4s. 100 ft. run.—MAY and BUTCHER, Timber Merchants, Heybridge, Maldon, Essex.

TO BUILDERS and HOUSEBREAKERS. Wanted, old Lead Roofings, Gutters, Pippings, &c. Contracts entered into for regular deliveries.—Send particulars and prices to J. A. FULLILOVE, Market Harborough.

TO BUILDERS.—Builders will be Financed on Estate, Kingston-on-Thames District; must have good references and capital for starting.—Apply Box 1220, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

TO SANITARY ENGINEERS and OTHERS. Seven or eight up-to-date Sanitary and Domestic Patents by a specialist for Sale.—Apply Box 1221, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

WANTED, 5 by 4 FOLDING CAMERA, rising front, R.R. lens, dark slides; exchange ¼-plate box camera, single lens, Wollensak shutter, and complete parts up to date, except two numbers, of "Architectural Review," clean, two volumes bound.—TANNER, 216, Old Ford Road, London, N.E.

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Telephone, No. 1011 HOLBORN. Manager—JOHN B. THORP. Telegrams: "DIVIDITORE," LONDON.

Educational.

R. I. B. A., SOCIETY OF ARCHITECTS AND CIVIL SERVICE TECHNICAL EXAMINATIONS, preparation by correspondence or residence. 29 first place. —G. A. T. MIDDLETON, 19, Craven Street, Strand.

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating.—For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

R. I. B. A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for syllabus to Mr. A. G. BOND, B.A. Oxon., A.R.I.B.A., 115, Gower Street, London, W.C. (late Howgate and Bond).

STRUCTURAL STEELWORK
Correspondence Classes specially for Architects, Assistants, Surveyors, Builders, and Draughtsmen, by the MIDLAND ENGINEERING BUREAU, STRAND, DERBY. Specialists in American and Continental Construction. Thorough Tuition. Send for descriptive booklet J., and read opinions of past students, and press notices, &c.

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Partnerships, Apprenticeships, Land, Sales by Auction, Businesses, Trade and General Advertisements (minimum 2s.)	0 6
Appointments Wanted or Vacant.	0 6
Four lines or under (about 30 words)	1 6
Each Additional Line (about 7 words)	0 6
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- 1259.—PLANS and SPECIFICATIONS prepared for any class of work.
- 1260.—MACHINIST, competent spindle and all-round hand, sharpener, cutter maker, &c.
- 1261.—ARCHITECT'S ASSISTANT; 21 yrs. genl. exp., Quantity Surveyor, &c.
- 1262.—ARCHITECT, 10 yrs. London exp., desires appt. view partnership; highest refs.; speciality, domestic work.
- 1263.—GENERAL FOREMAN; competent in all branches. Punctual timekeeper; ex. refs.
- 1264.—ARCHITECT'S ASSISTANT, 7 yrs. exp., wants further exp. in design and execution of buildings; no salary in good office; passed part R.I.B.A. final.
- 1265.—MACHINIST; Joiner, spindle, tenon, and genl. work, moulding machines, &c.; set out; good refs.
- 1266.—MACHINIST (24); spindle, hand improver, saw, bench, band saw, overhead, panel planer, make cutters and sharpener.
- 1267.—GENERAL FOREMAN (31); 16 yrs. exp., trade carpenter and joiner; quantities, estimating, drawing, &c.
- 1268.—ARCHITECT'S ASSISTANT (22½); draughtsman, construction, wkg. drawings, measuring and plotting, specifications, quantities; 6 yrs. exp.

See p. xx for the Employment Register.

Sale by Tender.

THE DARLEY DALE AND DISTRICT STONE COMPANY, LIMITED.

FOR SALE.—The FREEHOLD WHARF (adjoining Darley Dale Station) with Siding, Saw Mills, Offices, &c. Quarries, Fixed Plant, Loose Plant, Stock in Trade, and Goodwill of the above Company by Private Treaty.

Tenders will be received for the whole of the above in one lot as a going concern or in lots to suit purchasers.

The highest or any Tender not necessarily accepted.

Full particulars with Inventory and Conditions of Sale to be obtained on or before Saturday, August 5th, 1905, of the Liquidator, W. J. BARTON, Incorporated Accountant, Bentinck Buildings, Nottingham.

Contracts Open.



ARMY CONTRACTS.

SALE OF SURPLUS BOILERS, DISTILLING APPARATUS, DYNAMOS, AND OTHER PLANT AT BERMUDA, BARBADOS, ST. HELENA, AND WOOLWICH.

The Secretary of State for War is prepared to receive Tenders for the purchase of surplus Boilers, Distilling Apparatus, Dynamos, and other plant now lying at Bermuda, Barbados, St. Helena, and Woolwich, most of which is in first-rate condition, some lots being unused.

Forms of Tender, giving full description of the plant, particulars as to condition of the several lots and terms of contract, may be obtained on application to the under-mentioned Office.

The Tenders are to be delivered at the War Office, Pall Mall, London, S.W., by TWELVE o'clock noon on 1st September, 1905.

War Office,
Pall Mall, S.W.
3rd June, 1905.

HAMPTON URBAN DISTRICT COUNCIL.

TO BUILDING CONTRACTORS.

The above Council invite TENDERS for the ERECTION of a FIRE STATION and READING ROOM on land situate at Hampton Hill.

The drawings and specification may be seen, and forms of Tender obtained of Mr. SIDNEY H. CHAMBERS, Surveyor to the Council, upon application made, accompanied by a deposit of £2, on or after the 24th instant.

The deposit will be returned after a bonâ fide Tender shall have been received and placed before the Council, and in the case of an accepted Tender after execution of the Contract and bond required, and failing such execution the deposit will be forfeited to the Council.

A clause will be inserted in the Contract providing that the Contractor shall pay to the workmen employed in the execution of the work the wages generally accepted as current for workmen engaged on similar work in the district.

Sealed Tenders, endorsed "Tender for Fire Station and Reading Room," to be delivered to me not later than FOUR p.m. on TUESDAY, the 15th day of AUGUST, 1905.

The Council do not bind themselves to accept the lowest or any Tender.

By Order,
EDGAR COZENS,
Clerk to the Council.
Public Offices,
Hampton, Middlesex,
20th July, 1905.

TO ENGINEERS and Others.

The Metropolitan Asylums Board invite TENDERS for ALTERATIONS to ENGINEERING ARRANGEMENTS, &c., in the LAUNDRY at the South-Eastern Hospital, New Cross, S.E., in accordance with drawings and specification prepared by Mr. W. T. HATCH, M.I.C.E., M.I.M.E., Engineer-in-Chief.

Drawings, specification, conditions of contract, and form of Tender may be inspected at the Office of the BOARD, Embankment, London, E.C., on and after JULY 24th, 1905, and can then be obtained upon payment of a deposit of £2.

The amount of the deposit will be returned only to persons who have sent in bonâ fide Tenders, and returned drawings and specification in accordance with the regulations.

Tenders addressed as noted on the form must be delivered at the Office of the BOARD not later than TEN a.m., on TUESDAY, 5th SEPTEMBER, 1905.

By Order,
T. DUNCOMBE MANN,
Clerk to the Board.
July 19th, 1905.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

TENDERS—cont. from p. xiii.

Watford.—For the erection of new schools in Park-gate Road, for the Hertfordshire County Council. Mr. Charles P. Ayres, architect and surveyor, Watford:—

Clark Brothers	£11,052 15 0
Lorden & Son, Upper Tooting	10,951 0 0
Godson & Sons, Kilburn	10,897 0 0
Coulson & Lofts, Cambridge	10,818 0 0
Miskin & Son, St. Albans	10,800 0 0
W. King	10,800 0 0
G. Wiggs	10,735 0 0
Parnell & Son, Rugby	10,686 0 0
W. H. Hinkins, Royston	10,652 0 0
Webster & Cannon, Aylesbury	10,603 0 0
J. Darvill	10,540 0 0
J. L. Tyler	10,498 0 0
H. Martin, Northampton	10,440 0 0
W. Lawrence & Son, Waltham	
Cross	10,339 0 0
G. & J. Waterman	10,333 0 0
Hockley & Co., Grantham	10,175 0 0
J. Murray & Son	10,099 0 0
Clifford & Gough	9,999 0 0
H. B. Watkins	9,899 0 0
C. Brightman	9,875 0 0
Oak Building Co., Cambridge	9,749 18 7

* Accepted. [Architect's estimate, £10,468.]
[Rest of Watford.]

Wimborne.—For the erection of a new church house at Wimborne Minster. Mr. W. J. Fletcher, architect, Wimborne:—

George & Harding	£3,395 0 0	£3,021 0 0
Burt & Vick, Poole	3,217 10 0	2,967 0 0
Jenkins & Son	3,179 0 0	2,963 0 0
McWilliam	3,127 0 0	2,869 0 0
Norman Brothers, Wimborne	3,062 15 9	2,916 0 0
C. H. Green, Blandford	2,998 0 0	2,838 0 0
J. H. Childs, Yeovil	2,987 0 0	2,683 0 0
W. E. Jones & Son	2,923 0 0	2,739 0 0
F. Hoare & Son	2,895 0 0	2,815 0 0
J. Smith, Mayfield, Wimborne	2,884 10 0	2,618 0 0
A. J. Colborne,* Swindon	2,695 6 10	2,495 17 10

* Provisionally accepted. [Rest of Bournemouth.]
A.—Deal roof and joinery.

Wood Green.—For the erection of a new school in Lordship Lane, for the Wood Green Education Committee. Mr. C. J. Gunyon, architect, Town Hall, Wood Green:—

Foster Brothers, Norwood	£9,616 0 0
J. Thomas, Enfield	9,593 18 0
Appleby & Sons, Lambeth	9,549 0 0
W. A. Hyde, Norwood	9,268 0 0
A. Porter, Tottenham	9,076 0 0
J. Stewart, Tottenham	8,966 0 0

J. & C. Bowyer, Upper Norwood	£8,976 0 0
Rudd & Son, Grantham	8,900 0 0
H. E. Moss & Co., Southend	8,897 7 0
Treasure & Sons, Upper Holloway	8,751 0 0
Sands & Burley, Walthamstow	8,733 0 0
R. Dean & Co., Croydon	8,599 8 4
Banyard & Son, Cambridge	8,499 0 0
J. & M. Patrick, Wandsworth	8,439 0 0
Willmott & Sons, Hornsey	8,392 0 0
W. Lawrence & Son, Tottenham	8,244 0 0
A. E. Symes, Stratford	8,200 0 0
A. Monk, Edmonton	8,184 0 0
A. G. Crisp, Walthamstow	7,870 0 0
F. J. Holliday, London, E.	7,840 0 0
Pollard & Brand, South Tottenham	7,677 0 0
H. Knight & Son, Tottenham	7,664 0 0

Worcester Park (Surrey).—For the erection of a detached residence, stabling and coach-house, &c., for Mr. A. L. Gurney. Messrs. W. G. Tutt & Goodchild, architects, St. Olave's House, 18, Ironmonger Lane, E.C. Quantities by Mr. Frank D. Hickman, 18 and 19, Ironmonger Lane, E.C.:—

A. W. Jagers, Crofton Park	£7,384 3 6
Hibber Brothers, South Lambeth	7,100 0 0
G. E. Wallis & Sons, Maidstone	7,080 0 0
A. Leather, Wandsworth	6,989 0 0
J. Burges & Sons, Wimbledon	6,985 0 0
Sansom & Bishop, Thames Ditton	6,858 0 0
Braid Pater Co., 9, Bow Church-yard, E.C.	6,842 0 0
J. & C. Bowyer, Upper Norwood	6,839 0 0
J. Thomas, Enfield	6,831 0 0
T. & M. Patrick, Wandsworth	6,787 0 0
Aldin Brothers & Davis, South Kensington	6,780 0 0
J. Barker & Co., Kensington	6,733 0 0
Leslie & Co., Kensington Square	6,670 0 0
Holliday & Greenwood, Brixton	6,666 0 0
Enness Brothers, Erith	6,663 0 0
W. H. Lorden & Sons, Upper Tooting	6,575 0 0
J. Parnell & Sons, Rugby	6,571 0 0
H. C. Payne, Lambeth	6,556 0 0
T. T. Hawkins & Co., Ashford	6,533 0 0
Aldridge & Sons, Willesden	6,500 0 0
Turtle & Appleton, 141, St. John's Hill, S.W.	6,475 0 0
Higgs & Outhwaite, Cobham	6,474 0 0
Martin, Wells & Co., Belvedere Road, S.E.	6,400 0 0
Gathercole Brothers, Newbury	6,350 0 0
F. J. Shopland, Sutton	6,270 0 0
Oak Building Co., Camberwell	6,109 0 0
Cropley Brothers, Epsom	6,107 0 0
H. Flint, High Wycombe	5,977 0 0
J. Christie, Uxbridge	5,946 0 0
C. Sims & Co., 303, High Holborn, W.C.	5,908 15 0

Ynysybwl.—For the erection of chapel, for the English Wesleyans. Messrs. Morgan & Elford, architects, Mountain Ash:—
Watkin Williams, Pearl Street, Cardiff ... £1,600 0 0
Williams Brothers,* Ynysybwl ... 1,621 3 0
* Accepted.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending July 21st sixteen failures in the building and timber trades in England and Wales were gazetted.

J. HUNT, surveyor, Old Trafford. Adj. Aug. 14th.
A. BRUSH, builder, Woodford Green (late Chigwell). Adj. July 10th.

J. GLADSTONE, builders' merchant, Catford. R.O. July 11th.

B. NIGHTINGALE, builder, &c., New Cleethorpes. R.O. July 14th.

B. SHIRNMANN, builder, Whitechapel. P.E., London Bankruptcy Court, Aug. 15th, at 11.30.

W. THEOBALDS, architect and surveyor, 26, Budget Row, E.C. Liabilities £352; assets £7.

M. B. WILSON, jobbing builder, Newcastle-on-Tyne. P.E., Newcastle C.C., July 27th, at 11.

T. J. THOMPSON, painter and decorator, Church Stretton. Adj. July 11th.

J. FRIEDENTHAL, wallpaper merchant, Hull. Adj. July 12th.

R. STEWART, builder, Hatfield Woodhouse. P.E. Sheffield C.C., Aug. 3rd, at 2.

G. MOORE & SON, builders, Wrexham. P.E., Wrexham County Hall, Sept. 12th, at 12.

C. FARLEY, builder, Acton. Liabilities £3,017; assets £4,006.

W. C. HODGES, builder, Kempsey. Gross liabilities £216; estimated to rank £186; deficiency £171.

T. ROGERS, plumbers' and painters' general merchant, Manchester. Gross liabilities £2,983; deficiency £2,375.

J. M. KLENCK, surveyor, 8, Union Court, London. Liabilities £1,383; assets £234.

H. GRIFFITHS, builder, Seacombe. First meeting O.R.'s, Liverpool, July 28th, at 12.30. P.E., Birkenhead C.C., Aug. 2nd, at 10.30.

F. HODGES, builder, Isleworth and Ealing. First meeting, O.R.'s, 14, Bedford Row, W.C., July 28th, at 12. P.E., Brentford Town Hall, Aug. 11th, at 12.

J. MCCULLOCK, decorator, 25, Connaught Street, Edgware Road, W. First meeting, London Bankruptcy Court, July 31st, at 2.30. P.E., same, Aug. 29th, at 11.

S. SMITH, plumber, Mansfield. First meeting, O.R.'s, Nottingham, July 27th, at 12. P.E., Nottingham C.C., Aug. 4th, at 10.



RICHLY CARVED DOORS carefully reproduced from old models can be made in any hardwood, possessing all the elegance and richness of figure and colour found in the antique examples.

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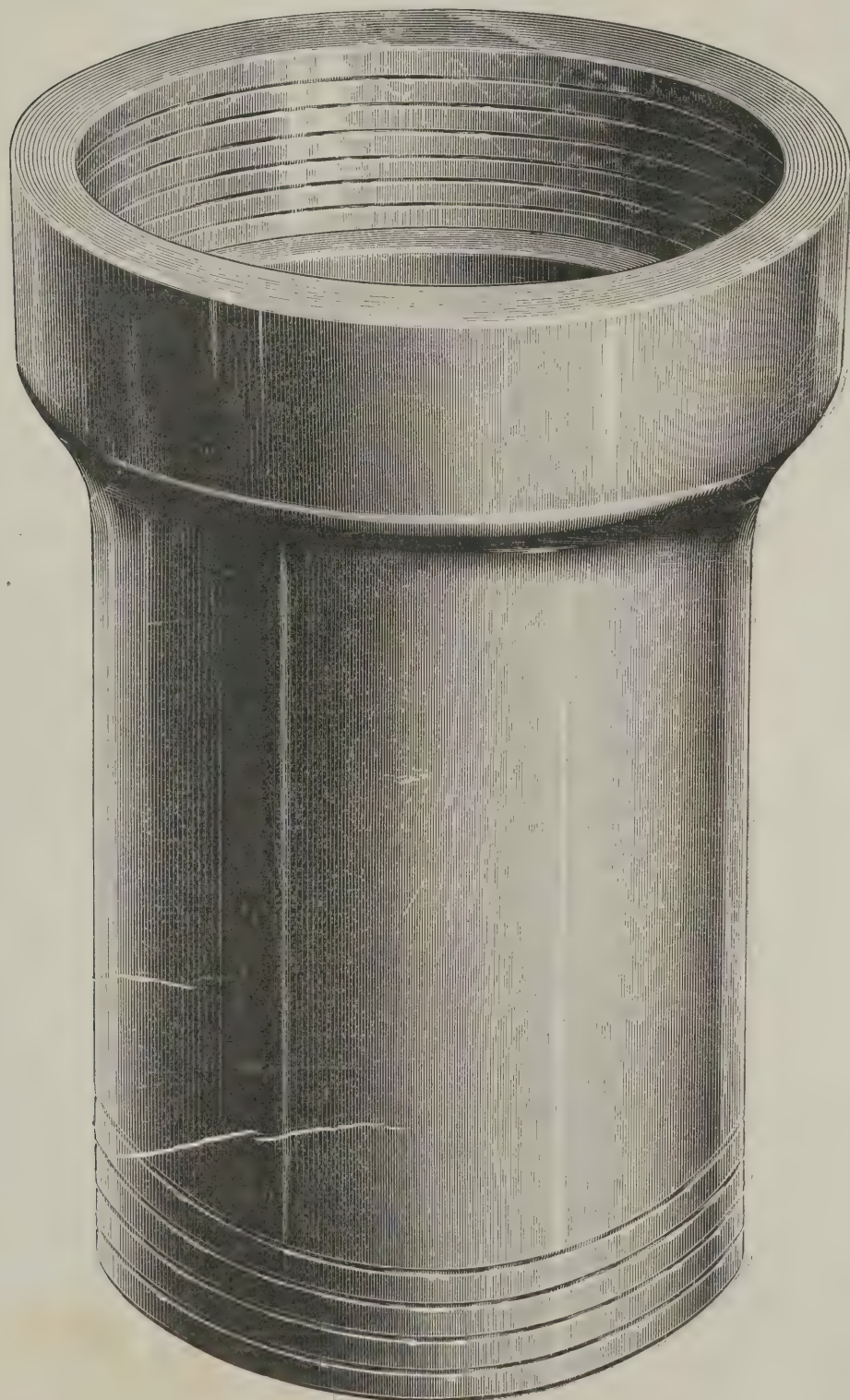
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Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans ...	per qr.	1	10	0	1	13	0
Clover, best ...	per load	3	15	0	4	2	6
Hay, good ...	do.	3	10	0	3	15	0
Sainfoin mixture ...	do.	3	10	0	3	17	6
Straw ...	do.	1	12	0	2	0	0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1	0	5	—	—	—
Colza Oil, English ...	do.	1	3	0	—	—	—
Copperas ...	per ton	2	0	0	—	—	—
Lard Oil ...	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbamate ...	per ton	16	0	0	—	—	—
Do. red ...	do.	15	0	0	—	—	—
Linseed Oil, barrels ...	per cwt.	0	19	6	1	0	0
Petroleum, American ...	per gal.	0	0	58	0	0	53
Do. Russian ...	do.	0	0	54	—	—	—
Pitch ...	per barrel	0	8	0	—	—	—
Shellac, orange ...	per cwt.	7	12	6	—	—	—
Soda, crystals ...	per ton	3	2	6	3	5	0
Tallow, Town ...	per cwt.	1	4	0	—	—	—
Tar, Stockholm ...	per barrel	1	6	6	—	—	—
Turpentine ...	per cwt.	2	3	9	—	—	—

METALS.

Copper, sheet, strong ...	per ton	81	0	0	—	—	—
Iron, Stat's, bar ...	do.	5	12	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	15	0	—	—	—
Lead, pig, Soft Foreign ...	do.	14	0	0	—	—	—
Do. do. English common brands ...	do.	13	16	3	—	—	—
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	14	0	0	—	—	—
Do. pipe ...	do.	15	0	0	—	—	—
Nails, cut clasp, 3in. to 6in. ...	do.	9	5	0	—	—	—
Do. floor brads ...	do.	9	0	0	—	—	—
Steel, Stairs, Girders and Angles ...	do.	5	7	6	5	12	6
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign ...	do.	145	0	0	145	10	0
Do. English ingots ...	do.	140	15	0	142	10	0
Zinc, sheets, Silesian ...	do.	26	15	0	—	—	—
Do. do. Vienne Montaigne ...	do.	27	0	0	—	—	—
Do. Spelter ...	do.	24	0	0	—	—	—

TIMBER.

Soft Woods.

Fir, Dantzic and Memel ...	per load	2	15	0	5	5	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American ...	do.	3	0	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Abyn, Yellow, 3rd, 4x9 ...	per std.	10	5	0	—	—	—
Do. do. do. 3x9 ...	do.	9	5	0	9	15	0
Do. do. do. 4th, 3x9 ...	do.	8	5	0	8	10	0
Do. Sandarne, Yellow, 3rd, 3x8 ...	do.	9	15	0	—	—	—
Do. Norrköping, Yellow, 1st and 2nd, 3x5 ...	do.	7	15	0	—	—	—
Do. do. do. 3x4 ...	do.	8	0	0	—	—	—
Do. Wasa, Yellow, Unsorted, 3x4 ...	do.	8	5	0	—	—	—
Do. Bure, Yellow, 1st, 2 1/2 x 7 ...	do.	9	15	0	—	—	—
Do. do. do. 2nd, 2 1/2 x 7 ...	do.	9	0	0	—	—	—
Do. Gefle, Yellow, 3rd, 2 1/2 x 7 ...	do.	10	0	0	—	—	—
Do. Montreal Red Pine, 1st, 3x11 ...	do.	15	0	0	15	10	0
Do. do. do. 2nd, 3x11 ...	do.	10	5	0	10	10	0
Do. do. do. 2nd, 3x9 ...	do.	9	15	0	10	0	0
Battens, all kinds ...	do.	6	10	0	11	10	0
Flooring Boards 1in. prepared, 1st ...	per square	0	10	3	0	11	0
Do. 2nd ...	do.	0	10	0	—	—	—
Do. 3rd, &c. ...	do.	0	7	3	—	—	—

HARD WOODS.

Ash, Quebec ...	per load	3	17	6	7	5	0
Birch, New Brunswick ...	do.	2	5	0	4	17	6
Do. Quebec do. ...	do.	2	10	0	5	10	0
Box, Turkey ...	per ton	7	0	0	20	0	0
Cedar, Cuba ...	per ft. sup.	0	0	3 1/2	0	0	3 1/2
Do. Honduras ...	do.	0	0	3 1/2	—	—	—
Do. Tobasco ...	do.	0	0	5	—	—	—
Elm, Quebec ...	per load	4	0	0	8	10	0
Jarrah, planks ...	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0	0	3 1/2	—	—	—
Do. Tobasco ...	do.	0	0	5 1/2	—	—	—
Do. Cuba ...	do.	0	0	2 1/2	—	—	—
Do. African ...	do.	0	0	3 1/2	—	—	—

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ROYAL WATERLOO HOSPITAL FOR CHILDREN AND WOMEN.

A SPECIAL appeal is being made for the Royal Waterloo Hospital for Children and Women, in Waterloo Bridge Road, London, S.E., to which we draw the attention of readers. The hospital was founded in 1816, and since then has afforded relief to more than a million poor patients, both children and women. A hospital was erected on the present site in 1823, and was subsequently enlarged; and though no doubt it was originally designed in accordance with the best knowledge then available, it is not surprising that in 1902 the building had become not only out of date from an architectural and sanitary standpoint but also in some respect an actual danger to the patients, by reason of the impossibility of keeping an old building, largely constructed of wood, free from injurious germs. This state of things was brought forcibly to the notice of the Board of Governors by their medical staff, who declared that it was absolutely necessary that immediate steps should be taken to rebuild the hospital. The work of rebuilding was therefore put in hand at once, and the greater portion of the new hospital has now been completed from designs by Messrs. Waring & Nicholson, of 38, Parliament Street, S.W. Messrs. Holliday & Greenwood, Ltd., were the contractors. The building, which is of red brick and terra-cotta, with a corner entrance porch in glazed ware—the gift of Messrs. Doulton & Co., Ltd.—is designed to contain 200 beds when the whole

hospital is finished, with a separate nurse home. The total cost, including furniture and apparatus, will exceed £50,000, and towards this rather more than £20,000 has at present been obtained. The cost of maintenance of the hospital when completed will probably be not less than £12,000 per annum, towards which there is only an assured income of £770 per annum, apart from subscription &c. An appeal therefore is made for funds which should be forwarded to the hon. secretaries of the Special Appeal Committee at 9, Regent Street, W.

New Companies.

WIMBLEDON COLOUR AND VARNISH CO., LTD. Mitcham and Wimbledon. In particular to acquire the recipes for and the right to manufacture and deal in certain substitute for turpentine known as "Turreps." Capital: £3,000.

ARTHUR LLOYD LTD., stone quarrymen and masons, Houghton, Lancs. Capital: £6,000.

PENGELUAN BUILDING CO., LTD., builders, contractors &c., Miskin, Mountain Ash, Glamorganshire. Capital: £5,000.

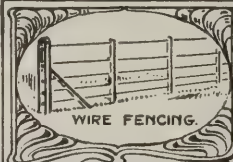
HUGH MCBRIDGE, LTD., plaster merchants, Belfast. Capital: £4,000.

HUDSON BROTHERS, LTD., carpenters, builders' merchants, &c., Llantrisant and Cardiff. Capital: £4,000.

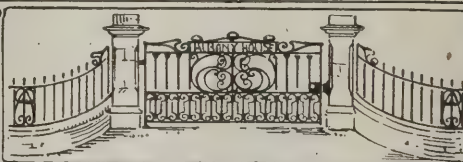
Coming Events.

Saturday to Monday, July 29-31.


INSTITUTE OF SANITARY ENGINEERS.—Summer Outing, to Southampton.



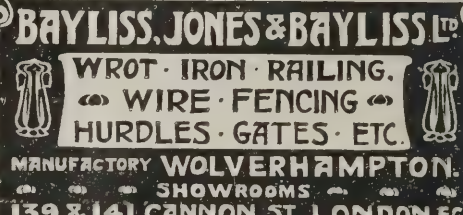
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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

August 2, 1905. Vol. 22, No. 547.

6, Great New Street, Fetter Lane, E.C

Summary.

At the Cheap Cottages Exhibition at Letchworth (Garden City) are to be seen examples of cottages in brick, either left plain, rough-cast or whitewashed, and cottages of wood, concrete slabs, expanded metal, patent fire-resisting slabs and reinforced concrete. A number of representative examples are illustrated in this issue. (Page 58.)

A first premium of £600 and six other premiums of lesser value are to be offered in connection with the competition for the Palace of Peace at the Hague. (Page 66.)

The Royal Engineers' South African Memorial at Chatham, unveiled last week by the King, takes the form of an arch designed by Mr. E. Ingress Bell, F.R.I.B.A. (Page 66.)

Lord Wemyss, writing to the "Times" on the subject of ancient monuments in Westminster Abbey, deprecates the mutilation and removal of historic statues to make room for modern ones. (Page 72.)

The Goodyear Exhibition of Architectural Refinements, which was to have been held at Edinburgh this month, has, owing to the lack of time and the difficulty of getting the exhibits together, been postponed until September 5th. The exhibition will then be held in the National Portrait Gallery, Edinburgh. (Page 66.)

The amount of space per bed in work-houses required by the Local Government Board, irrespective of that occupied by doors and fireplaces, is as follows:—For aged infirm, 5ft. wall space and 50ft super. floor space; for able-bodied inmates, 4ft. and 34ft. respectively. (Page 71.)

In his paper on school planning read before the London congress of the Royal Institute of Public Health Mr. E. R. Robson, F.S.A., cited the new Bluecoat School at Horsham as an example of a poor site, owing to the subsoil, and *vice versa* that of Lancing College. Staircases, he advised, should be in short flights, no flight exceeding twelve steps, and of an easy gradient. The so-called French rule—namely, that twice the rise added to the tread should be equal to 24ins.—was perhaps the best. For artificial lighting he declared emphatically in favour of acetylene gas. (Page 67.)

Allegations of receiving commission from a builder were made at a meeting of the Marylebone Borough Council last week against one of the sanitary inspectors in the employ of the council. The builder alleged he had paid the inspector £240, and although the latter emphatically denied this he has been suspended pending the decision of the Local Government Board. (Page 69.)

The new Royal Naval Hospital at Chatham, begun in 1899, has cost about £400,000. Accommodation is provided for 600 patients. (Page 66.)

In Praise of English Sanitation.

WE frequently hear disparaging remarks, more especially from painters, on the dingy streets and sordid houses of our large towns as compared with foreign cities; but though in this matter we may be deficient as regards outward show it is worth while remembering that we stand pre-eminent in what, after all, is the greater matter, namely, the interior of our buildings. We are first and foremost in sanitation, not only in respect of fittings but also in the greater sense of healthy planning, ventilation and water-supply. For many years past we have made vast strides in these directions, and there is now hardly a small town which has not its public sewers and by-laws that compel the provision of water-closets and prevent contamination of the air by the proximity of ashpits and dampness in subsoil. The efforts of our medical men and sanitary engineers do not, however, receive the appreciation they deserve, though the Royal Institute of Public Health, the Royal Sanitary Institute, and other associations, exist for the promotion of these measures of national safety. Our sanitary engineers and plumbers are continually improving fittings but receive little commendation. English manufacturers of sanitary ware and appliances hold the Continental markets, though they are experiencing a continual increase in competition from foreign firms, whose fittings are intricate but inferior in other respects to our own. Even the United States, with all its boasting, cannot compare for sanitary efficiency with this country, while on the Continent sanitation is practically non-existent. Only the largest towns there are provided with sewers, and these have open untrapped gulleys that smell abominably, while the canals and rivers are nauseating. Most of the houses have the ordinary pan-closets, and many of the hotels—even if the latter do have water-closets with English fittings—have little or no supply of water to flush them. English architects, therefore, if they cannot rival their foreign brethren in grandiloquent exteriors, beat them in giving comfort to the occupants of their buildings by greater consideration for sanitary fittings and healthy planning. The French alone are said to be able to plan monumentally. However that may be, foreign planning is hygienically bad. In this country there has been a continual reduction of the death-rate, and if there is a physical deterioration of the race it is not due to imperfect sanitation, but must be traced to the crowding of

people into towns, where there is an insufficiency of air and chances for exercise, and by reason of the inefficient and insane being allowed to multiply. Our population is no longer chiefly engaged in agriculture, and we should therefore take means to gain the exercise and fresh air that are so necessary for constant good health. But in the matter of sanitary efficiency we need not fear.

The End of Archaeology.

THE time has gone by when architects and others were so unfortunately blinded by the halo of antiquity as to think that everything old was estimable and beautiful, though, of course, there is always with us a remnant of fogs whose delight it is to go into raptures over ancient remains in every nook and cranny of the earth. The fact is, much old work is deadly dull stuff, badly designed and clumsily executed; and a course of study in ecclesiastical buildings of bygone days, however desirable for historical reasons, is boring to anyone in touch with the best work of to-day. We have heard too much of that egregious phrase "the loving hand of the workman." It has led us into all sorts of pitfalls and brought us through that appalling era of "repoussé" when anything in the nature of a smooth surface was to be regarded as the most undesirable of all results: an era of bumps and rough places—all exemplary of "the loving hand of the workman"—and products more suggestive of the Old Stone Men than of people living in our midst. It would be idle to attempt to disparage the delightful examples of design and handicraft which are to be seen in old buildings up and down the country, in comparison with which the bulk of modern work of a similar kind is sadly deficient. What we mean to infer is that archaeology, as it was understood in the last century, is now to all intents and purposes a dead letter among moderns: in proof of which we need only ask how much interest is evinced in lengthy descriptions of some mediocre church dating even from centuries ago? That this is the case we regard as a healthy sign, because the all-absorbing study of the past merely as archaeology kills any hope for fresh work in the present. Therefore we urge—and in our columns we endeavour to promote—the claims of the best work done to-day; the problems of to-day; and the excellent achievements of to-day. An architect is not a scenic but a constructional artist. His material is the present, his heritage the past: and his education the knowledge of the present more than the study of the past.

THE CHEAP COTTAGES EXHIBITION.

LAST week we gave some particulars of the initiation and aim of the Cheap Cottages Exhibition which is now being held at Letchworth (Garden City), in Hertfordshire. We are now able to give a number of specially taken photographs of some of the most interesting cottages, together with plans and particulars. Before proceeding, however, to deal in detail with the cottages, it will be as well to make some comment on the all-important question of cost. The idea of this exhibition is to show what can be done for £150, but we very much question whether many of the cottages have been erected for this sum, despite the naïveté with which this is set down as a fact in the exhibition catalogue; indeed, we feel certain that a great many of them have cost something very much nearer £200 than £150; and in considering this exhibition it is also necessary to remember that when "cost" is spoken of it seems to mean, not only the expenditure minus architect's fees and builder's profit, but also (in the majority of cases) minus the carriage on materials, fencing and the numerous other necessary requirements of a cottage, which, in actual everyday work, have an awkward way of totalling up the cost. Moreover, as the exhibition is specially intended to show the

public what can be done for the money, it is necessary, we think, to point out that these are not what can really be called £150 cottages, because that sum (even assuming it is not exceeded) is nothing but the bare cost of the work. Hence a comparison between the cost of cottages built by landowners on their estates and those now to be seen at Letchworth will be entirely false unless the fact is borne in mind that in the one case everything has been included, while in the other only the actual labour and materials are taken into account.

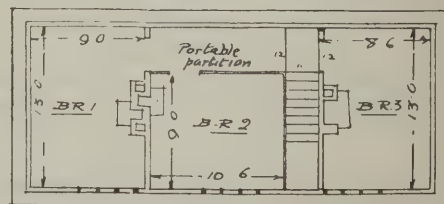
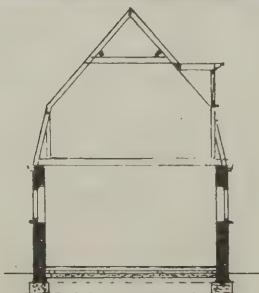
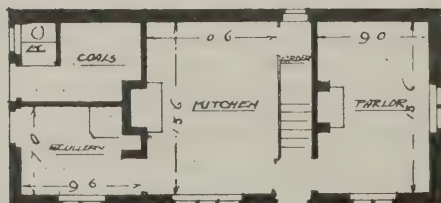
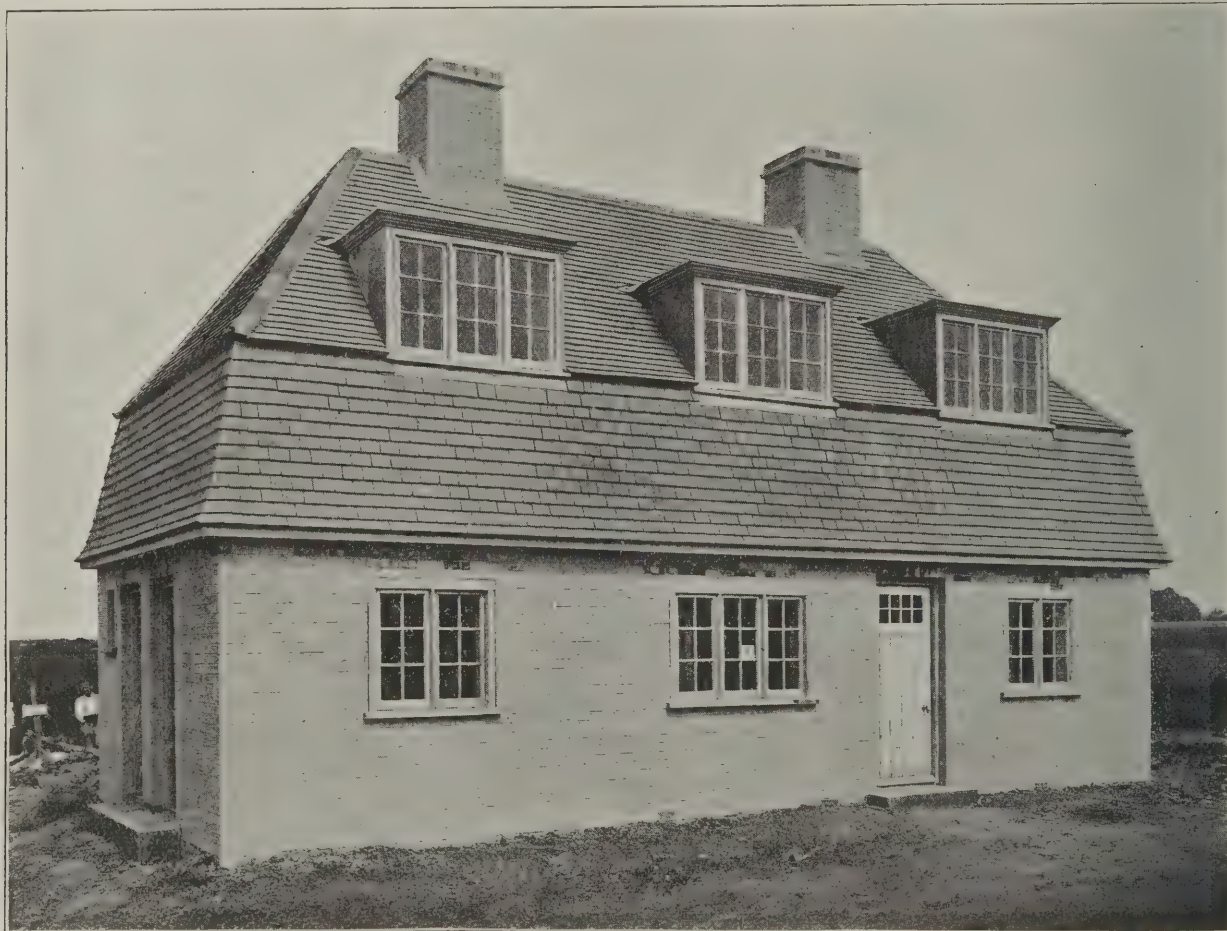
With that preface and its warning (which we make in no spirit of disparagement of this very useful exhibition, but rather that the actual truth be known) we may proceed to give some particulars of the cottages here illustrated.

Brick Cottages.

It is fitting perhaps to begin with cottages of brick. Of these there is a great number—some of them left plain, others rough-cast and others whitewashed. A very interesting and well-designed example is afforded by the pair of cottages by Mr. Geoffrey Lucas, A.R.I.B.A., illustrated on the opposite page. Each of these has a front room 14ft. 6ins. by 10ft. 6ins. by 7ft. 6ins., with a kitchen or living-room behind 14ft. 6ins. by 10ft. 7½ins. by 7ft. 6ins., fitted with range and bath; also a scullery 6ft. 6ins. by 5ft. 6ins., sink and

copper; coal-hole, larder, &c. On the first floor are three bedrooms 14ft. 6ins. by 8ft. 3ins. by 10ft., 12ft. 9ins. by 7ft. 3ins. by 10ft., 9ft. 9ins. by 7ft. by 10ft. The cost is put at £400, including carriage of materials to site, contingencies, drainage, and other items, which is at the rate of 5½d. per ft. cube. The walls are of 9in. bricks and the roof is tiled. There is a concrete bed under the floors, which are of timber. The instructions were to use white Arlesley bricks and sash windows, both of them difficult things to employ (the sash windows particularly so) in a small building, the height of which had to be kept as low as possible on account of cost, but it will be generally admitted that the architect has been very successful in his result.

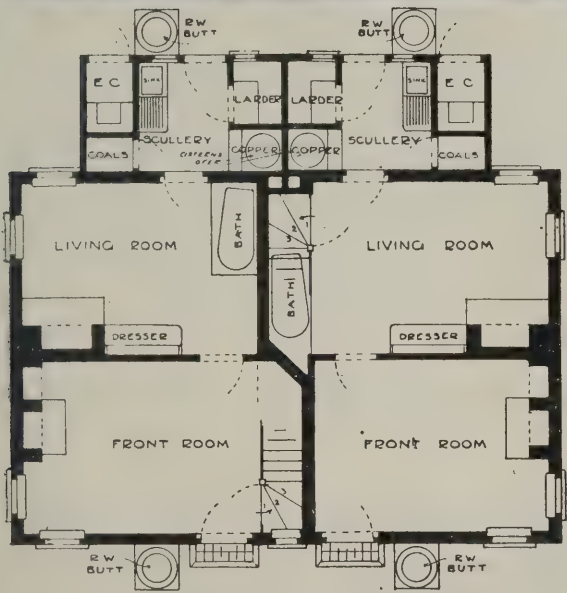
Another very interesting brick cottage is that by Mr. A. H. Clough, of Ringwood, the cost of which is put at £135. It consists of two floors on which are arranged a living-room or kitchen (with range), 13ft. 6ins. by 10ft. 6ins. by 7ft. 6ins.; larder; scullery with fireplace and copper, 9ft. 6ins. by 7ft.; coals, earth-closet; and at the other side of the cottage a parlour, with grate, 13ft. 6ins. by 9ft. by 7ft. 6ins. Above are three bedrooms, 13ft. by 9ft. by 8ft., 10ft. 6ins. by 9ft. by 8ft., and 13ft. by 8ft. 6ins. by 8ft. The walls are 1½ins. hollow, the floors



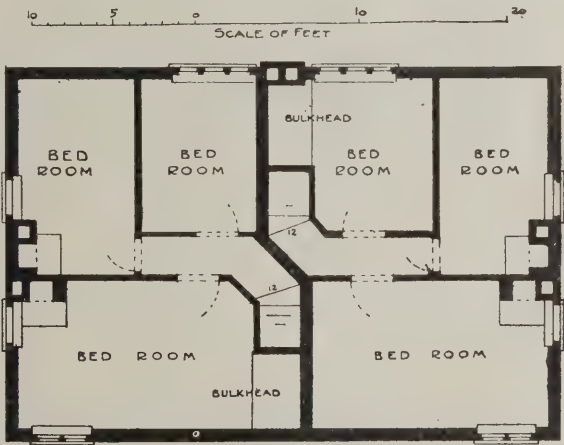
BRICK COTTAGE BY A. H. CLOUGH: COST £135.



PAIR OF BRICK COTTAGES BY GEOFFRY LUCAS, A.R.I.B.A.
COST £400.



GROUND FLOOR PLAN



FIRST FLOOR PLAN

boarded, the roof of Bridgewater tiles, and the foundations of concrete.

Of other brick cottages here illustrated we may refer to those by Mr. A. Randall Wells (p. 62) and Mr. M. H. Baillie Scott. Mr. Wells's cottage is a detached cottage, white-washed, the cost of which is estimated at £150, plus the profits and other items deducted in accordance with the conditions. The cottage is on two floors and consists of a living-room 15ft. by 14ft. by 7ft. 6ins.; sitting-room, 14ft. by 10ft. by 7ft. 6ins.; scullery with bath, 14ft. by 7ft. by 7ft. 6ins.; larder and fuel store, each 7ft. by 5ft. by 7ft. 6ins., and two cupboards. Above are three bedrooms, 14ft. by 10ft. by 8ft. 6ins., 15ft. 4ins. by 11ft. 6ins. by 8ft. 6ins., and 14ft. 6ins. by 14ft. by 8ft. 6ins., all with hanging

recesses and fireplaces. The walls are gin. brick. The ground floor, except the parlour, is of red quarries, and the parlour and bedrooms 1in. boards on wooden joists. The roof is of hand-made pantiles and the foundations are of cement-concrete. Comfort, health, tidiness and cheapness are the special advantages claimed for this cottage.

The pair of cottages by Mr. Baillie Scott, of Bedford, is illustrated on p. 61. The cost price is put at £420, or £35 per room. Each cottage contains a kitchen or living-room, 12ft. by 20ft. by 7ft. 6ins.; parlour, 12ft. by 9ft.; scullery, with gas stove, &c., 9ft. by 12ft. by 8ft.; pantry, &c.; bedrooms, 12ft. by 13ft., 11ft. by 7ft. and 12ft. by 9ft.—all 8ft. high. The walls are of gin. brick, rough-cast, with oak half-timber. The

ground floor is paved with red bricks and the upper floors are boarded. The roof is of oak, red tiled, and the foundations are of concrete. The two cottages are so arranged that they can be turned into one.

Concrete Cottages.

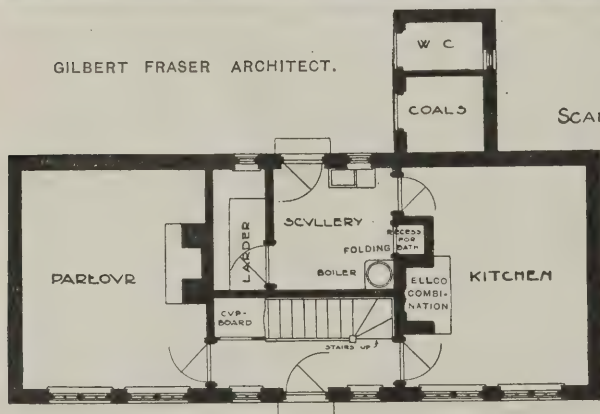
Many cottages in concrete are shown. That illustrated on the next page was designed by Mr. Gilbert Fraser for the Concrete Machinery Co., Ltd., of 18, Water Street, Liverpool. The walls are built with concrete blocks made on the site by means of the company's portable "Pioneer" hand-power machine, having a minimum capacity of 150 blocks (each 32ins. by 9ins. by 10ins.) per day. This cottage has on the ground and first floors the following accommodation:—Parlour, 14ft. 6ins. by 12ft.; kitchen, 14ft.



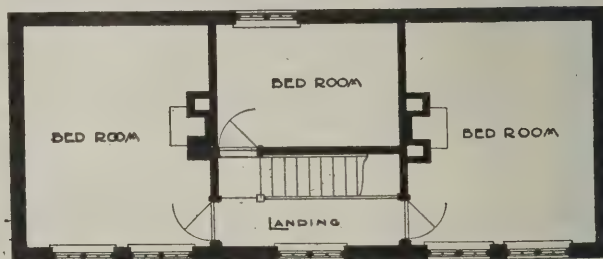
GILBERT FRASER ARCHITECT.

CONCRETE BLOCK COTTAGE. COST £150.

SCALE OF 10 5 0 10 20 FEET



GROUND FLOOR PLAN



FIRST FLOOR PLAN

6ins. by 12ft.; scullery, 8ft. by 8ft.; larder, 8ft. by 3ft. 6ins.; staircase and entrance hall, 11ft. 6ins. by 6ft.; landing and staircase, 11ft. 6ins. by 6ft.; bedrooms, 14ft. 6ins. by 12ft., 14ft. 6ins. by 12ft., 11ft. 6ins. by 8ft. The floors are of wood on a solid floor, and wood boards on wood joists. The roof is tiled and the foundations are of concrete. The cost is put at £150. It is stated that a cottage like this can be erected in six weeks and that $\frac{1}{8}$ th and $\frac{1}{4}$ th per cent. on the total cost would be saved respectively by erecting two and four at a time.

Messrs. Potter & Co., Ltd., have erected three concrete cottages, with which we shall deal in our concluding article next week. Another interesting cottage (illustrated on p. 64) is that to be built by Mr. John A. Brodie, M.I.C.E., M.I.M.E., city engineer of Liverpool, designed to cost £150, or 3 $\frac{3}{4}$ d. per ft. cube. Concrete slabs made from destructor clinker slightly reinforced with steel are to be used for the walls, the thickness being 6ins. throughout. The floors are to be of concrete with tongued and grooved boarding in the centre; the roof and foundations are

also to be of concrete. The principle adopted for the construction of each room in the building has been that of a dove-tailed box, in which each of the four sides, the floor and the ceiling of the rooms, is made of one concrete slab suitably reinforced with steel and made in a mould. The cottage contains a kitchen 12ft. by 13ft. by 8ft., with range; parlour, 8ft. 6ins. by 13ft. by 8ft., with fireplace; scullery, 7ft. by 8ft. by 8ft., with sink and boiler; larder; w.c.; bedrooms, 12ft. by 13ft. by 8ft., 8ft. 6ins. by 13ft. by 9ft., 7ft. by 11ft. 3ins. by 8ft.; pantry, &c.

Another type of concrete construction is to be seen in the one-floor cottage or bungalow designed by Messrs. Hesketh & Stokes (p. 64), and now being erected by Messrs. Cubitt. The plan is that of a polygonal figure of sixteen sides, this being on the principle that the nearer a building approaches a circle the larger is its contained area. The rooms, it will be seen, are grouped around a central hall of 50ft. super., the kitchen, with range, being 154ft. super., scullery 77ft. super., parlour 115ft. super., two bedrooms 77ft. super. each, and the third

bedroom 115ft. super.: average height of rooms 9ft. 6ins. The walls are formed of 2in. slabs of concrete separated by an air-space, the roof of concrete slabs covered with slates, and the floor and foundations of reinforced concrete not less than 6ins. thick in any part, with wood floors to living-rooms. The divisions between the rooms are formed with 2in. concrete slabs. The chimneys are collected together centrally. The cost of this cottage is put at £200, but it is stated that there would be a saving of 2 $\frac{1}{2}$ per cent. if two were built together and of 5 per cent on four.

"Mack" Slab Cottages.

Messrs. J. A. King & Co., of 181, Queen Victoria Street, E.C., have built a bungalow and a cottage from plans prepared by Mr. V. Dunkerley. We give a plan and elevation of the former on p. 63. This comprises (on the ground floor only) a living-room, with range, 16ft. by 12ft. 6ins. by 9ft.; scullery, with copper and stove, 7ft. 5 $\frac{1}{2}$ ins. by 7ft. by 9ft.; larder, w.c., coals, &c.; three bedrooms, 12ft. by 9ft. 4ins. by 10ft., 11ft. by 9ft. 4ins. by 10ft., and 11ft. by 8ft. by 9ft. The walls

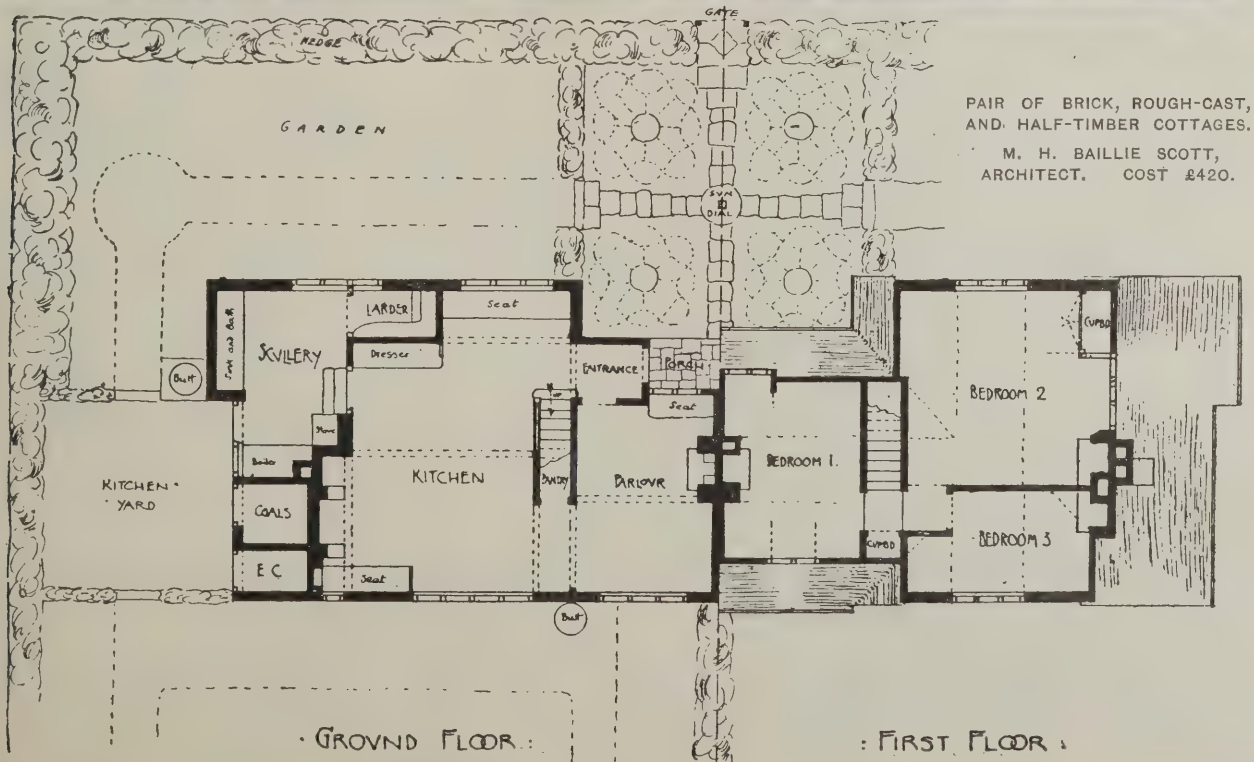
are of "Mack" partition slabs 4ins. thick, the exterior being covered with rough-cast. The floors are wood blocks laid in bitumen on a 6in. bed of Portland-cement concrete. The roof is of timber, covered with machine-made tiles, and the foundations are of concrete. All the rooms lead from a small hall lighted from the roof, the doors of the three bed rooms being so arranged that a curtain can divide these from the rest of the house. The whole of the materials used are "Mack" partition and ceiling slabs, the only brickwork erected being in the construction of the fireplaces. The cost is put at £130, or 3½d. per ft. cube—£118, excluding builder's profit. The cottage erected by this firm is on two floors, and contains a living-room, with range, 15ft. 10ins. by 14ft. 2ins. by 8ft. 9ins.; par-

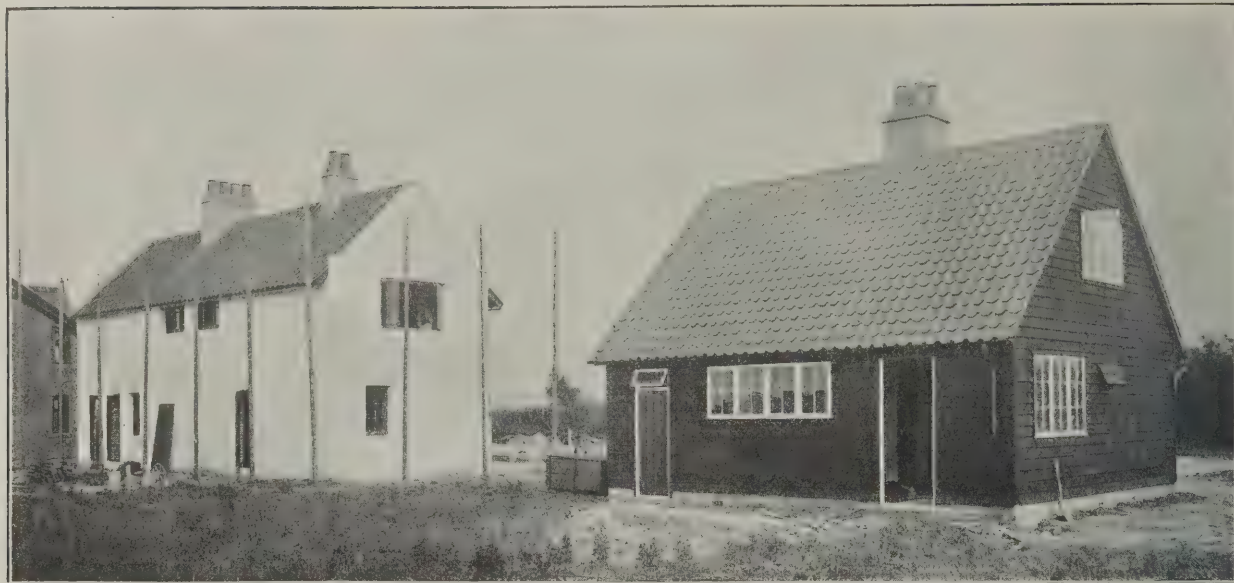
lour, with register grate, 11ft. 9ins. by 11ft. by 8ft. 9ins.; scullery, with self-setting range, copper, and folding bath having hot and cold water, 11ft. 9ins. by 7ft. 6ins. by 8ft. 9ins.; bedrooms, 13ft. 4ins. by 12ft. 6ins. by 8ft. 6ins., 13ft. 5ins. by 9ft. by 8ft. 6ins., 10ft. 6ins. by 9ft. 7ins. by 8ft. 6ins.; larder, coals, w.c., scullery, dresser, store cupboards, &c With the exception that the hall, scullery and conveniences are laid with red quarries, the walls, roof, floors and foundations are similar to those of the bungalow. The outer walls to the height of the first-floor window-sills are of "Mackolith," this being a composition of Mack slabs faced with tiles to represent brickwork. The tiles are keyed to the slabs in the process of making, and it is impossible to loosen or detach them. The cost is esti-

mated at £150 (£25 per room), or, including builder's profit £165 (£27 10s. per room).

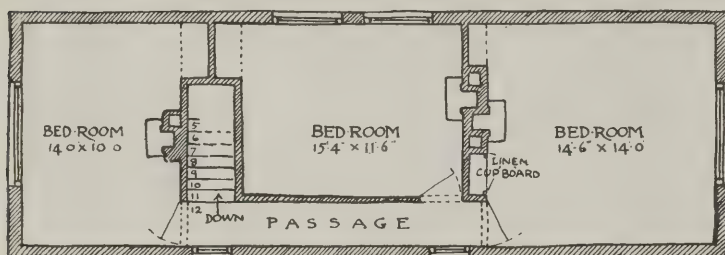
The Uralite Cottage.

Messrs. Wheeler & Son, of Horsham, have designed for the British Uralite Co., Ltd., of 50, Cannon Street, E.C., a cottage which contains (all on the ground floor) a kitchen 16ft. by 11ft. by 8ft. 2ins.; scullery, 8ft. by 8ft. by 7ft. 10ins.; bedrooms, 9ft. 6ins. by 7ft., 12ft. 6ins. by 10ft., and 10ft. by 7ft. 6ins.—all 7ft. 10ins. high; larder, coal-house and w.c. The walls are 4½ins. to underside of floor-boards, and faced with rin. cement rough-cast; 9in. footings. There is a damp-course of double-course slates in cement, 4in. by 4in. angle-posts, and 4in. by 3in. studding covered with Uralite Kent board both sides, painted and sanded externally and whitened inter-

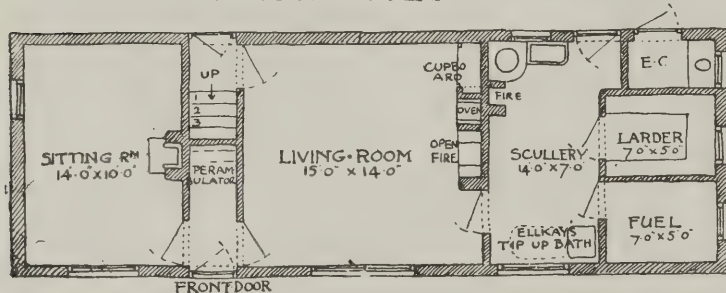




BRICK COTTAGE BY A. RANDALL WELLS (£150) AND TIMBER COTTAGE BY F. W. TROUP (£150).



FIRST FLOOR PLAN



GROUND FLOOR PLAN

PLANS OF COTTAGE BY A. RANDALL WELLS.

nally. Floors, joists, 6ins. by 2ins., 12ins. apart; 4in. by 3in. plates on sleeper walls; 1in. white flooring. The roof is rough-boarded and covered with 12in. by 8in. red Uralite Kent-board tiles. The foundations are of 6in. concrete. The cost is put at £150, or 4d. per ft. cube. The advantages of this cottage are stated as follows:— Cheap; permanent; fire- and vermin-proof; cool in summer, warm in winter; ease and rapidity of erection.

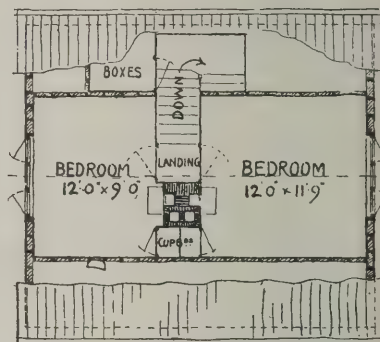
New Expanded Metal Co., Ltd.

This firm has erected one detached and two semi-detached cottages (see p. 64). The dimensions of the single cottage, which consists of ground and upper floors, are as follows:— Living-room, with range or kitchener, 14ft. 6ins. by 9ft. 6ins. by 7ft. 6ins.; parlour, with mantel grate, 11ft. by 10ft. 3ins. by 7ft. 6ins.; scullery in kitchen, with movable copper; bedrooms, 14ft. 6ins. by 9ft. 6ins. by 8ft., 10ft. 3ins. by 8ft. by 8ft., 9ft. 3ins. by 6ft. 6ins. by 8ft.; sheds for coals, wood, &c., pantry and two cupboards. The dimensions of the semi-detached cottages are:— Living-room, 15ft. 6in. by 14ft. by 8ft., with range; scullery, 9ft. by 8ft. by 8ft., with movable copper; pantry and three cupboards, and sheds for coal, &c.; bedrooms, 12ft. by 11ft. 3ins. by 8ft., 12ft. 6ins. by 7ft. 6ins. by

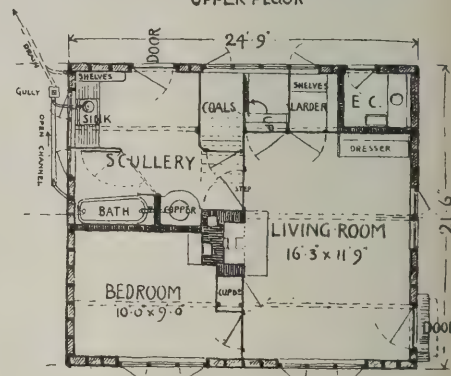
8ft., 9ft. by 6ft. 6ins. by 8ft. The external walls are of timber framing with expanded metal lathing and Portland cement plaster in two skins, giving 4ins. hollow space. The internal walls are of expanded metal lathing and plaster, 2ins. thick. Floors, timber joists and flooring boards, with expanded metal lathing and plaster ceilings. The roofs are of asbestos slate on timber framing, and the foundations of concrete. The cost is put at approximately £150 each cottage, or 5½d. per ft. cube; three could be erected in about six weeks. The special features are the ease with which the materials can be obtained, transported and erected; lightness and durability of the structure; and the even temperature and dryness on account of the hollow external walls.

Wood Cottages.

Some of the cottages are of wood. One by Mr. F. W. Troup, of 14, Gray's Inn Square, W.C., is illustrated above. This has a living-room with range, 16ft. 3ins. by 11ft. 9ins.; scullery with copper, 11ft. by 10ft.; larder, coal-place, &c. and two cupboards, besides a bath which can be shut off the scullery. There is a bedroom on the ground floor 9ft. by 10ft. and two bedrooms above (attics) 12ft. by 11ft. 3ins. and 12ft. by 9ft. The walls are framed of 4in. by 2in. timbers,



UPPER FLOOR



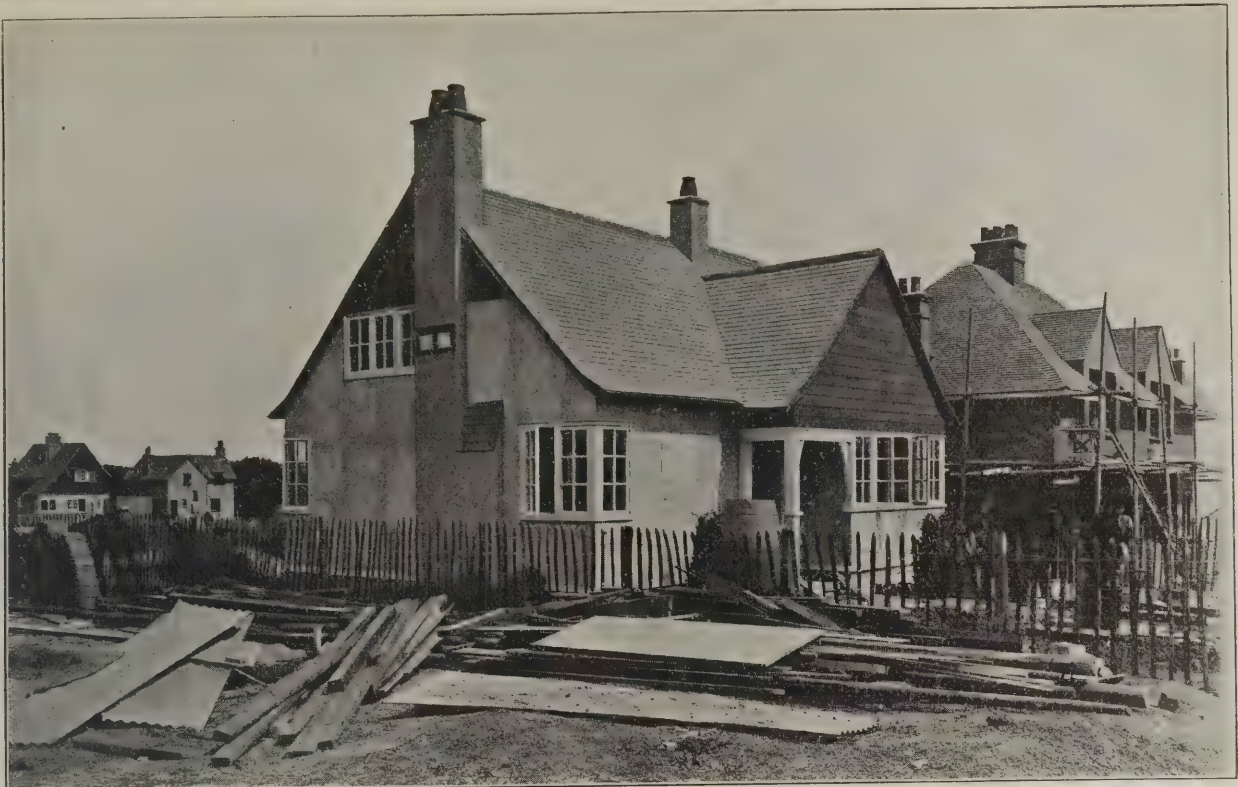
GROUND FLOOR

PLANS OF COTTAGE BY F. W. TROUP.

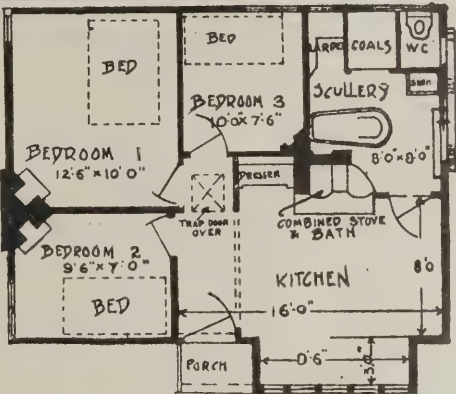
braced and covered with insulating paper and weather-boarding outside; lathed and plastered inside. The chimneys and foundations up to the floor-level are of brick. The roof is of pantiles and the foundations are of 6in. cement concrete over the whole area, and extending 6ins. beyond the walls all round. The special features claimed for this cottage are the avoidance of patents, and the fact that any repairs would be easy and inexpensive. The cost is put at £150, or 4½d. per ft. cube, and it is stated that the cottage could be duplicated for the same sum plus the profits, &c.

This concludes our description of the cottages illustrated in this issue. Next week we shall give a further series of photographs and plans, together with other descriptive particulars.

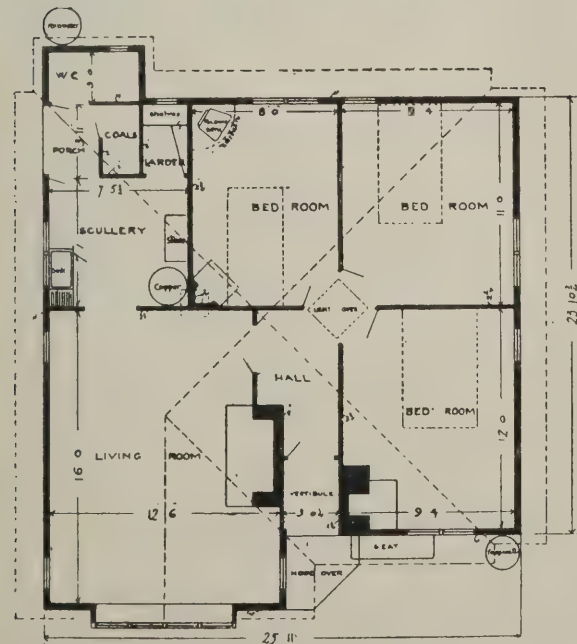
A Sanatorium has been opened at Eden Hall, Woodford Green, Essex. The building cost £47,000, and has accommodation for twenty patients.



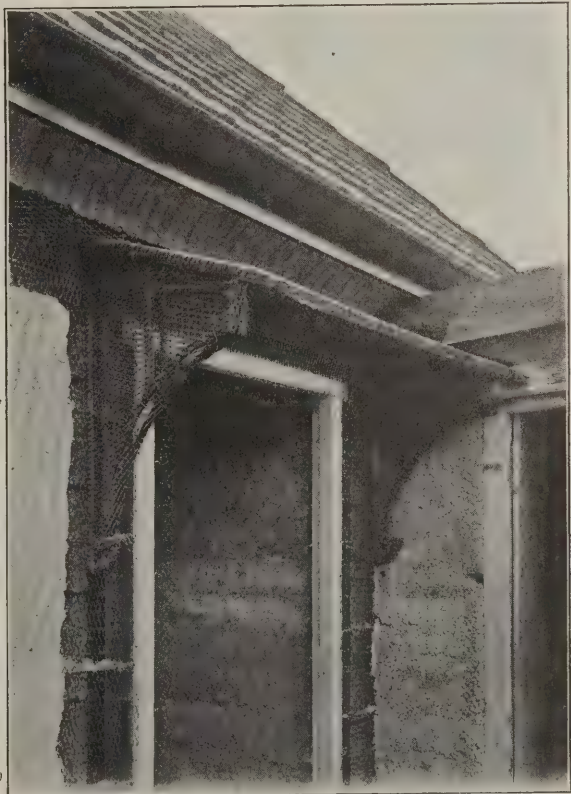
COTTAGE BY BRITISH URALITE CO., LTD. WHEELER AND SON, ARCHITECTS.
COST £150.



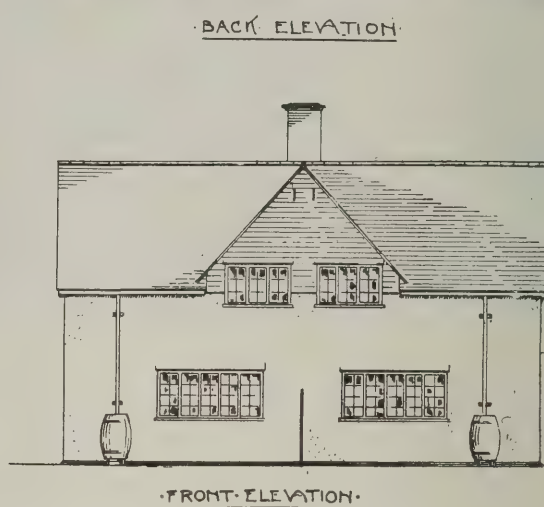
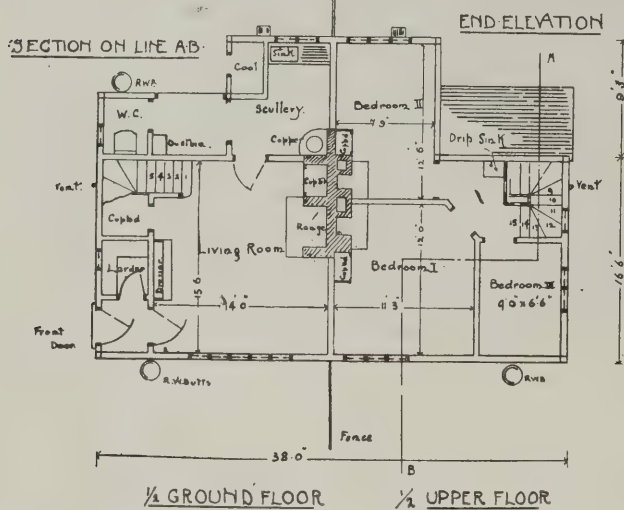
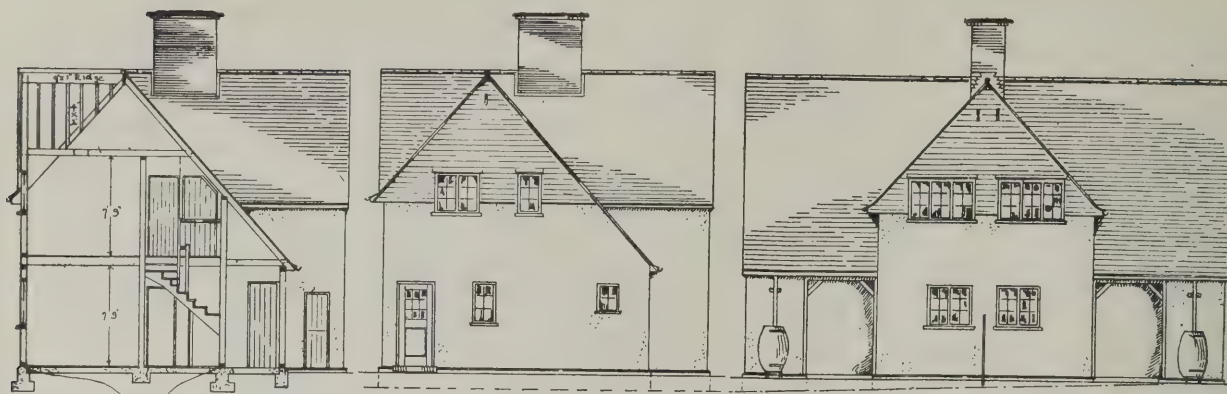
SOUTH ELEVATION



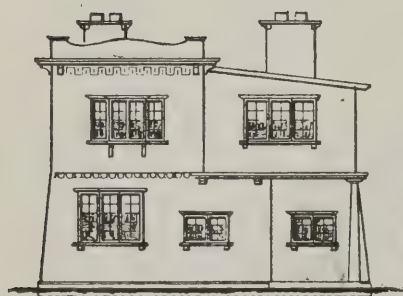
BUNGALOW BY J. A. KING & CO. ("MACK" SLABS, ROUGH-CAST.)
V. DUNKERLEY, ARCHITECT. COST £130.



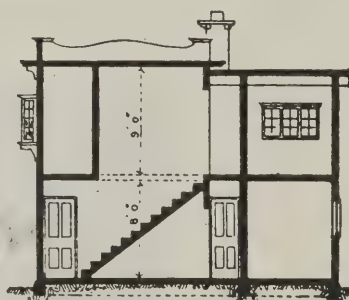
DOOR HOOD FORMED WITH EXPANDED METAL.



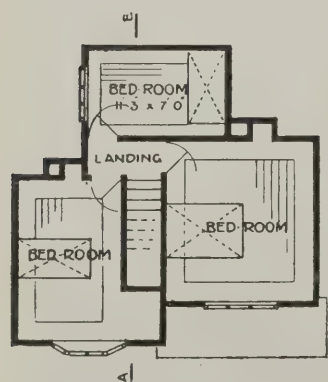
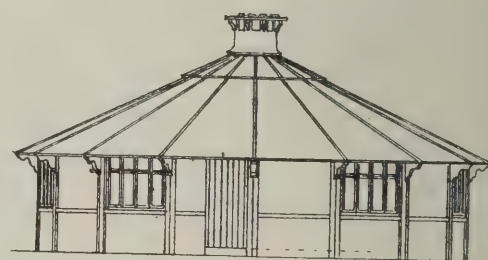
SINGLE COTTAGE AND PAIR OF COTTAGES BY NEW EXPANDED METAL CO., LTD. OLDRID SCOTT & SON ARCHITECTS. COST £150 EACH COTTAGE.



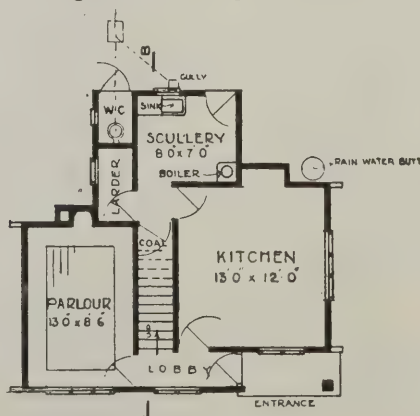
SOUTH ELEVATION



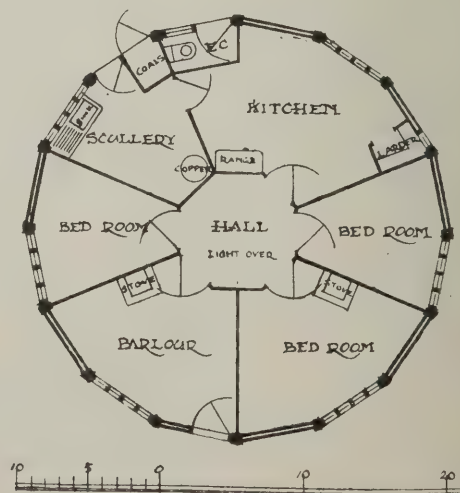
SECTION A-B



FIRST FLOOR PLAN



GROUND FLOOR PLAN



CONCRETE SLAB COTTAGE BY JOHN A. BRODIE, M.I.C.E., M.I.M.E., CITY ENGINEER, LIVERPOOL. COST £150.

REINFORCED CONCRETE COTTAGE BY CUBITT, HESKETH AND STOKES, ARCHITECTS. COST £200.

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Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, August 2nd, 1905.



PARR'S BANK, MANCHESTER.

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HEATHCOTE & SONS, ARCHITECTS.

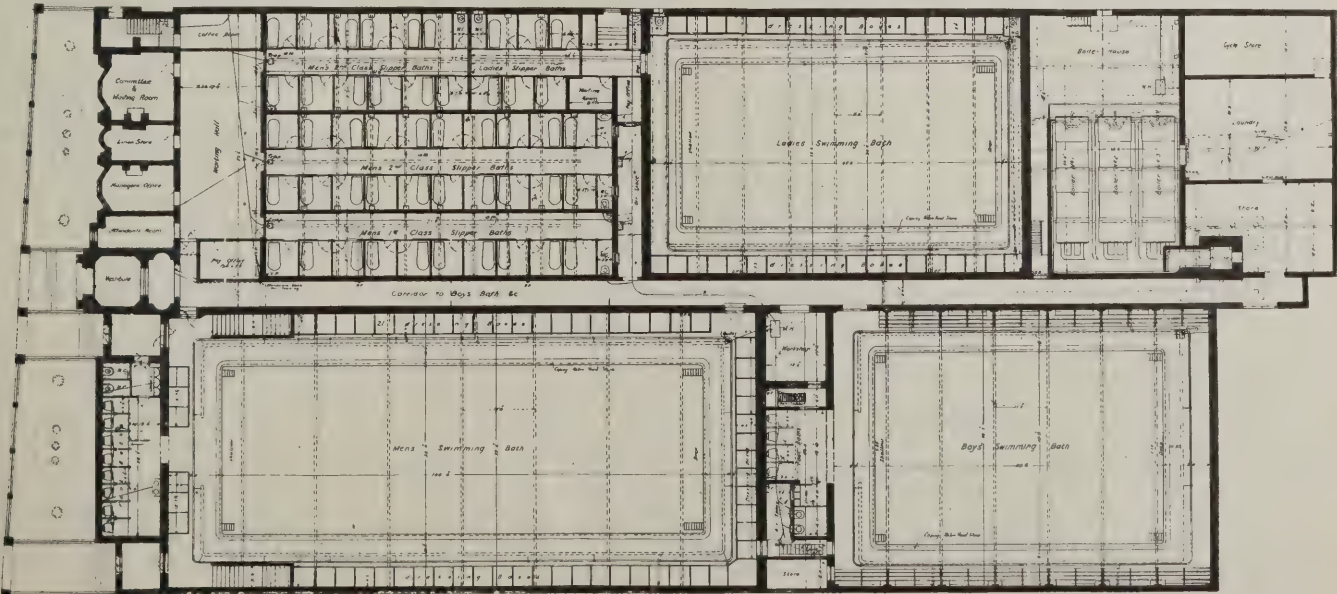
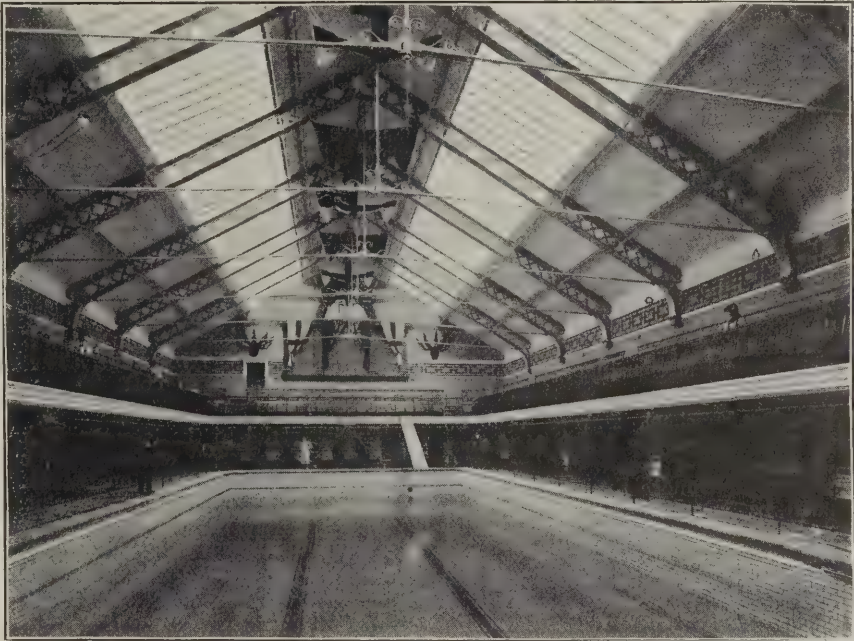
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NEW BATHS AT HULL

THE new baths at Hull illustrated on this page have been built for the northern and north-western portions of the city on a site at the corner of Beverley Road and Epworth Street. The accommodation is as follows:— Men's swimming-bath, 100ft. by 35ft.; depth of water, 3ft. 9ins. to 6ft. Boys' swimming-bath, 60ft. by 40ft.; depth, 2ft. 6ins. to 4ft. Ladies' swimming-bath, 65ft. by 34ft.; depth, 3ft. 3ins. to 5ft. Also forty-eight slipper-baths. The elevation of the building is in red Leicestershire sandstocks with dressings of Ancaster stone. The covering of the cupolas and Mansard roof is of copper. In the large swimming-bath the gallery is of steel and concrete, and is fitted with tip-up seats. A new feature for Hull has been the provision of spray-baths for washing. The slipper-baths are of enamelled porcelain, and are provided with hot and cold showers. The waiting hall for these baths is 38ft. by 17ft., and has a refreshment buffet at one end. The floors throughout the public part of the building, except in the long corridor to the boys' bath, are of marble mosaic. The lower part of the walls where not exposed to rough treatment is tiled and

elsewhere faced with enamelled bricks, the upper part being faced with buff bricks, relieved in places with coloured bricks. The building is lighted throughout by electric light, Nernst lamps being used in the larger rooms. The ventilation of the large swimming-bath is assisted by sun-burners placed under the ventilators (Boyle's). For heating the swimming-baths two methods are available. In beginning to fill the baths hot water is passed in from one or two of the boilers until the water has reached a certain level, when the hot water is cut off and steam turned on from another boiler. This steam passes through an injector, which draws the water from the deep end of the bath and returns it at the shallow end, and after the bath is filled the temperature is maintained and the water kept in circulation by this method. An efficient steam laundry is provided, and the towels, &c., are in a room over the boilers, utilizing heat which would otherwise be wasted. The building and engineering work was designed by the city engineer (Mr. A. E. White, M.I.C.E.), the assistant in charge of the work being Mr. T. Thomas. The contractors for foundations and bath tanks were Messrs.



NEW BATHS AT HULL. A. E. WHITE, M.I.C.E. (CITY ENGINEER), ARCHITECT.

E. Good & Sons, of Hull, and for the superstructure Messrs. Quibel, Son & Greenwood, of Hull. The mosaic paving is by Messrs. Hodkin & Jones, of Sheffield; the tile and faience work by Mr. Alfred Whitehead, of Leeds; hardwood joinery by Messrs. H. Arnold & Son, of Doncaster; and laundry machinery by Messrs. W. Summerscales & Sons, of Keighley. The cost of the buildings and fittings may be taken as £25,000, which is £2,000 below the amount of the estimate, and works out at 7½d. per cub. ft.

Keystones.

The Junior Institution of Engineers.—Mr. Dugald Clerk, M.I.C.E., the well-known gas-engine expert, has been elected president for the ensuing session.

A new Baptist Church at St. Margaret's, Richmond (Surrey), is to be built at a cost of £2,500. Mr. F. J. Brewer is the architect and Messrs. S. N. Soole & Son, of Richmond, are the contractors.

A new Fire-brigade Station at Swansea has been erected on a site between Alexandra Road and High Street at a cost of £8,500. Mr. John Williams was the contractor and Mr. Bell (borough surveyor) the architect.

30,000,000 Bricks.—In defence of the proposal of the Lancashire County Council to erect a new lunatic asylum on clay subsoil, it was stated at a Local Government Board enquiry recently that the clay would be used for making the 30,000,000 bricks required, and thus bring about a saving of £12,500.

St. Martin's Church, Caerphilly.—An extension has been made to this church, providing seating accommodation for 370 persons at a cost of about £3,000: the whole scheme amounts to upwards of £7,000. Messrs. Halliday & Rogers, of Cardiff, are the architects, and Messrs. Blacker Brothers, the builders.

Ancrum Road School, Dundee, is to be enlarged from designs by Mr. J. H. Langlands, architect, at a cost of £8,000. For the first time in Dundee the use of electric light will be adopted in a school. Mr. Langlands is also endeavouring to secure the adoption of a system of local telephones between the classrooms and the headmaster's office.

An old Mahogany Stair Balustrade to be removed from old Dunnikier House, Kirkcaldy, is offered for sale. The balustrade winds around an open well-hole 3ft. in diameter to a height of four storeys. There are in all 110 finely wrought and turned spiral balusters. Mr. D. Forbes Smith, architect, has a very high opinion of this piece of old craftsmanship.

The Royal Engineers' South African Memorial at Chatham, unveiled by His Majesty the King last week, takes the form of an arch and was designed by Mr. E. Ingress Bell, F.R.I.B.A. A principal feature is a series of sculptured panels in high relief (by Mr. W. S. Frith) showing blockhouses, a pontoon bridge, a military balloon and a destroyed railway bridge. Two other panels, representing Paardeburg and Wagon Hill, are required to complete the series. The composite capitals to the columns, the stones of the arch (figures of Victory) and the spandrels containing representations of the medals for the campaign are the work of Messrs. Fagan & Bell; the marble tablets and inscriptions by Messrs. Farmer & Brindley; and the copper lamps on the detached piers by Messrs. Thomas Elsley, Ltd. The general contractors were Messrs. Longley & Co., of Crawley.

The memorial statue to Queen Victoria at Nottingham, by Mr. Albert Toft, was unveiled on Friday last.

An equestrian statue of the late Duke of Cambridge is proposed to be placed on a site opposite the Horse Guards and the new War Office.

The new Parish Council Chambers at Hamilton, which have been designed by Mr. Alexander Cullen, architect, will be built of Earnock stone.

Blackpool's new Sea Defence Works and Marine Promenades, which have occupied nearly three years in construction, at a cost of little short of £450,000, were completed last week.

A Semicircular Seat of Dartmoor Granite has been erected as a memorial near Colyton. It was executed by Messrs. Harry Hems & Sons, of Exeter, from designs by Mr. T. Phillips Figgis, F.R.I.B.A.

Competition for the Palace of Peace.—In the competition to be held for the erection of a Palace of Peace at the Hague a first premium of £600 and six other premiums of lesser value are to be offered. The award will be made by a jury consisting of an Englishman, a German, a Frenchman, a Dutchman, an Austrian and an American.

Laying the Last Brick.—Councillor Craig, architect, of Leith, recently ascended to the top of the chimney of the new electric tram-car depôts at Leith Walk (a height of 208ft.) and laid the last brick. The foundation was laid in soft running sand, and consists of concrete 40ft. in diameter and 12ft. thick, weighing 520 tons. The chimney weighs 1,800 tons.

South African Memorial Buildings, Eton College.—Princess Alexander of Teck laid the foundation-stone of these buildings on Saturday. There will be a school hall 140ft. long, 55ft. wide and 45ft. high, an octagonal library of about 55ft. diameter, and a classical museum. The architects are Mr. L. K. Hall and Mr. Sydney K. Greenslade. The buildings are estimated to cost not less than £40,000.

The Memorial to the late Dr. Temple in Canterbury Cathedral was unveiled by the Archbishop of Canterbury on Saturday. It takes the form of a pedestal upon which rests a kneeling figure, in an architectural setting, the whole monument being surrounded by an oaken canopy. Mr. W. D. Caröe was responsible for the design and Mr. F. W. Pomeroy for the figure, while the setting was executed by Mr. Hitch.

The new Royal Naval Hospital on Chatham Hill was visited by His Majesty the King last week. Accommodation is provided for 600 patients. There are fourteen general wards, each 120ft. by 28ft. and containing 28 beds. Begun in 1899, the hospital has cost about £400,000. The contractors were Messrs. Perry & Co., of Bow. Sir Henry Pilkington, R.E., was the engineer-in-chief and Mr. J. C. T. Murray, F.R.I.B.A., the architect. The work was carried out under the superintendence of Mr. S. P. Brinson, C.E.

The Origin of the Royal Academy.—It is probably a mistake (says Mr. Clouston in the "Burlington Magazine") to suppose that Angelica Kauffman was included as an original member of the Royal Academy through Reynolds's influence; it is, in fact, much more likely that she had a good deal to do with the actual grant of the Charter. Whatever the Academy may or may not have done to justify its existence, nothing can be more certain than that it was founded on pique and came into being through backstairs intrigue. Angelica had Queen Charlotte's ear, and her influence with Royalty could only have been second to that of Sir William Chambers, the Royal drawing-master.

OUR PLATES.

THE new head-office of Parr's Bank in Manchester is situated at the corner of York Street and Spring Gardens. The exterior is built in red Carlisle stone, the design being Classic Renaissance. The whole area is given up to the bank's premises on the ground floor and basement, the three floors above being let as offices. The two large strong-rooms in the basement are most completely armoured with triple-steel on walls, floor and ceiling. On the banking floor great attention has been paid to the decoration. All the walls are lined with marble, as will be seen by the photograph. The saloon roof over the clerks' chamber, which is glazed completely across its whole span, is finished with enriched fibrous plasterwork. All the woodwork is polished mahogany, and the large window frames are of bronze. The fittings are of white metal. On the upper floors a special feature is made of the corridors to the office suites, which are treated with fibrous plaster arched work. The builders were Messrs. Neill & Sons, of Manchester, and the architects Messrs. Charles Heathcote & Sons, of Manchester and London.

THE GOODYEAR EXHIBITION.

OWING to the lack of time and the difficulty in getting the exhibits to this country by a given date, the opening of the Goodyear Exhibition of Architectural Refinements at Edinburgh will not, as previously announced, take place in August, but has been postponed until September 5th. The exhibition will be held in the National Portrait Gallery, Queen Street, Edinburgh, and it is hoped that those who are interested in Mr. W. H. Goodyear's researches, and may wish to be present at the opening, will kindly send in their names to the hon. exhibition secretary, Mr. L. Ingleby Wood, Edinburgh Architectural Association, 117, George Street. A feature of the exhibition will be the very fully illustrated catalogue which has been specially prepared for the occasion by Mr. Goodyear, and which is illustrated by a series of blocks lent by the directors of the Institute of Arts and Sciences, the "Architectural Record" and the "American Journal of Archaeology."

Builders' Notes.

A new Industry at Leeds is being developed by the Northern Asphalt and Roofing Works Co. (Mr. G. H. Plows, general manager). The firm has contracts on hand for the supply of 5,000 sq. yds. of asphalt pavement for the new Princess Parade extension at Bridlington, 5,500 sq. yds. of asphalt roofing for the Bristol Docks Harbour Board, and 1,500 sq. yds. of asphalt pavement for the Selby isolation hospital. The laying of bitumen sheeting at the Ferry Bridge waterworks and the manufacture of bitumite for cable laying for electrical purposes—which is about 33½ per cent. cheaper than the ordinary bitumen shipped from Trinidad—have also been in the hands of the company.

Obituary.

Mr. George Brown, builder and quarry-master of Hamilton, died recently, aged 41.

Mr. Alexander Hendry, of the firm of Messrs. Hendry & Keith, house carpenters and builders, of Aberdeen, died recently, aged 75.

The late Mr. John Nash Peake, brick and tile manufacturer, of the Tunstall and Rosemary Hill Tile Works, left estate of the gross value of £27,438.

SCHOOL PLANNING.

AT the recent London congress of the Royal Institute of Public Health several papers were read on the planning of schools. We give reports herewith.

Mr. Robson's Paper.

A paper on "The Planning of Educational Buildings" by Mr. E. R. Robson, F.S.A., was read by Mr. Philip A. Robson, A.R.I.B.A. The author said that, having travelled much in Europe and America to glean from the best educational buildings; having built hundreds of schools; having been consulting architect to the Government for nearly twenty years; and, in short, having spent the best years of his life in the work, he proposed to touch on such hygienic points as he could establish from his own observation and experience, regarding it as a duty to do this little to advance a subject on which he had ever felt himself to be a pioneer.

As a preliminary he directed attention to the late Sir Douglas Galton's little book on "Healthy Houses," because its simplicity and scientific truth stamped it as one of the most valuable and useful contributions to their main subject.

Sites.

The hygiene of a school really commenced with the site; therefore its surroundings should not provide foul smells or nuisances, should be free from stagnant water or undrained land, should not discharge surface-water on to the site, and should be innocent of any obstruction to sunshine or to the free passage of air all round.

Being large and airy, the site should, by preference, be fairly elevated, sheltered from north-east winds, open to the south and sloping away from the school. The subsoil should never, unless unavoidable, be of clay, but of a dry porous character giving a natural outlet for drainage, and in towns provided with at least one frontage to a wide street commensurate with the area of the site. The best shape was square. The water-supply must be sure. An example of a poor site owing to the subsoil was the new Bluecoat School at Horsham, and, *vice versa*, that of Lancing College might be cited.

The position of the buildings on the site was to be considered together with

Playgrounds.

which should face as nearly south as possible, be thoroughly underdrained with agricultural pipes, levelled, enclosed, and the surface laid with tar pavement or asphalt laid to fall sufficient for the effectual removal of all surface-water. Space should not be lessened nor usefulness impaired by needless buttresses, hiding corners, nor by internal quadrangles which were not open at the corners. For elementary and infant schools without central halls playgrounds were uncovered schoolrooms.

Some years ago, in a lecture at Brighton, the late Dr. Benjamin Richardson had advocated the raising of all houses a few feet above the ground, with a through current of air below, after the manner common in Switzerland. Though this theory created some amusement at the time, it was quite true that low-lying school sites, with the playground at a high level, did require this treatment; if land were costly, the space might be utilized by increasing the height to serve the purpose of a covered playground.

Wherever playsheds were provided, apex or ridge ventilation was necessary. The playground fencing should be unclimbable and all gates lockable. It was well to remember also that where large quantities of material had to be brought to the school buildings a double gate soon paid for itself by saving hand-cartage from the road.

If a water-fountain were placed in the playground it should be arranged with a

keyed waste-tap at the base and a stopcock inside the building to prevent bursts in frosty weather.

Entrances.

The number of entrances would vary according to the size of the school, but however many there were it was desirable to place them so that as little north and east winds as possible rushed into the school buildings. In elementary schools two entrances and staircases would suffice for 250. Above that number more would be necessary. The width of an entrance should never be less than 6ft., but a greater width might be desirable in some cases. The main doors should open outwards, and inner swing-doors were most desirable. Moreover, as much dirt as possible should be kept outside these swing-doors by means of scrapers, iron mats and fibre mats, for obvious hygienic reasons. The flooring of the corridors should be of tiles or granolithic paving.

Cloakrooms and Lavatories.

These seemingly unimportant rooms, if not properly planned, led to endless confusion, and might spread disease to a large extent. Glazed brick was best for the wall surface, and an impervious but dry flooring, such as good granolithic or one of the cork and plaster-of-Paris and cement compositions now on the market. Asphalt should not be used, as the condensation on its surface of the moisture in the air was highly disagreeable and unhealthy. The rails and pegs were best made of iron or steel, and each peg should be numbered. Why the space ordained by the Board of Education per child in secondary schools was now 1ft. and in the elementary schools 6ins. lineal in cloakrooms was difficult to understand: 1ft. per child would give greater aëration to the clothes, but would entail very large cloakrooms, and consequently great expense without an adequate return. All cloakrooms should be near the entrances, and needed to be planned to obviate confusion and to prevent any smell from the clothes entering the school proper. Hanging stands should be wired at the back to prevent clothes back to back from touching each other, and, incidentally, to prevent pilfering.

In boys' and infants' schools 4ft. gangways (4ft. 6ins. centre to centre) sufficed admirably with adequate organization. In girls' schools 5ft. centre to centre should be allowed. In secondary schools a much larger amount was necessary, dependent on their use. If used as changing-rooms, then 18in. lockers and 6ft. gangways were the minimum.

The height of a cloakroom in an elementary school need not exceed 9ft. if the room were thoroughly ventilated and heated. This height would enable mezzanines to be used with economical and practical effect.

Lavatory basins should not be placed in the cloakrooms, but in separate rooms inside the building and as near the cloakrooms as possible. Also the cloakrooms should not be made passages either to the lavatories or to the school, as at Hymers College, Hull.

Staircases.

The staircases should be fire-resisting, in short flights, no flight exceeding twelve steps, and of an easy gradient. The so-called French rule was perhaps the best to ensure a comfortable "going," namely, twice the rise added to the tread should be equal to 24ins. The surface of the tread should not wear badly nor work slippery. Handrails should be provided to both sides on the salt-glazed brickwork. Staircases which would take more than two persons abreast was dangerous, unless a centre handrail were provided, and when this was done another staircase should have been built instead. Emergency staircases in schools were ridiculous. Sufficient permanent staircases were necessities. The position of each staircase varied in each school, and it was

impossible to lay down any final rule on the subject. It was wasteful of the best light to face them south.

Central Halls.

In the best schools of the last few years a central hall was usually to be found; but in some of the newer schools a marching corridor was occasionally substituted, if there were some other rooms which might be thrown together for purposes of assembly.

A central hall should have an area of from 1,200ft. upwards, but too large a one was both extravagant and useless. Classes should not be held in this hall; though under exceptional circumstances, and where the hall had direct light, which could be obtained from the left side of the scholars, one class was admissible, and in secondary schools the hall might be used for art classes.

Classrooms.

All classrooms should be entered from the central hall through glazed doors opening into the classrooms. The amount of space per child to be provided had long been a bone of contention.

The official rules of the Committee of Council of Education originated in the perception that an architect without knowledge of school-working could know nothing of its planning, and in a desire to connect the inspector of elementary schools with their builders. It was then considered a great mark of progress to go beyond the old 6 sq. ft. per child, as held in Berlin, and to lay down a minimum of 8ft. of area for teaching-rooms.

Mr. Robson said it took him some years of struggle to get that 8ft. changed to 10ft. and to see it adopted by the Education Department as to new schools.

Recently a batch of rules as to secondary schools had appeared. These, with varied wording, were borrowed largely from his own rules, and it was necessary to say that he disapproved strongly of the minimum provision of 18ft. per child therein laid down. It was a needless extravagance, justifiable neither on grounds of education nor of health, and when it was stated that the residence of the teacher must be a "gentleman's house," only laughter was possible.

Cubic Space per Child.

From the experience of other countries 14ft. per child was as much as was necessary in either secondary or elementary schools, but the question of a cubic unit was a more far-reaching matter. It was established that, for reasons of health, no scientific reason existed for making classrooms of a greater height than 10ft. In American schools an average of 164 cub. ft. was usual, so that, with 14 sq. ft. per child and a room 12ft. high, the cubic content per child was 168 cub. ft., or 4ft. more than in America.

The numbers to be contained in each classroom might vary from eighteen to thirty-six in secondary schools and from eighteen to fifty in elementary schools; and elasticity of working was attained best by classes of forty and fifty in the latter and eighteen to thirty in the former.

In elementary schools dual desks 3ft. 4ins. long, with 1ft. 4in. gangways, were the most satisfactory when efficiently designed; but a more economical form, both in itself and in planning for it, was a continuous desk containing three separate seats. The objection to this was that the centre child had to disturb, even if slightly, one of the others in order to get out during school-time.

In secondary schools separate seats were necessary 2ft. wide with 18in. gangways.

In every classroom it was best to have a gangway at the back of the room, and, if a single desk were placed next to the side walls, to leave a space of 6ins. between it and the desk.

The Lighting of Classrooms

was the next important matter, after having settled the correct cubic space per child.

The unscientific lighting and the improper shapes of desks used in schools were largely to blame for the increase of weak sight. The following rules would be found satisfactory if taken together:—

1. A room facing south (or thereabouts) should have not less than one-sixth of its floor area as clear window glass, and those facing north (or thereabouts) one-fourth actual glass area, not window space.

2. No room was properly lit without subsidiary light if the distance from the window-wall to the wall opposite was more than 25ft.

3. All light should come to the left side of the scholars.

4. No windows should face the scholars or the teacher except for ventilation, or for subsidiary light behind the scholars in the corner of the wall away from the main light.

5. The rooms should not be less than 10ft. high; 12ft. was ample.

6. The height between the top of the glass and the ceiling should be never more than 2ft., preferably less.

7. The height from the floor to the bottom of the glass, 4ft.

8. The ceiling should be white, the walls very pale green (non-poisonous and washable), the ordinary woodwork white (enamel).

9. Heavy piers should be avoided if possible between the windows; also thick mullions and transoms and very small panes.

Artificial Lighting.

The best form of artificial lighting was by acetylene gas generated by an apparatus in which the calcium carbide dropped into water, and then the gas should pass through a purifier. Having used this form for some years, after considerable experiment and after having used every other kind of illuminant, he had no hesitation in making this statement. Acetylene was no more dangerous than coal-gas. The next best method of lighting was by purified coal-gas and incandescent mantles. The objection to this form was its heat and consequent deterioration of the air. The worst form was electric light, unless the red ray were killed, but it was the most convenient, and if used with common-sense was comparatively inexpensive.

Thermometers.

Whatever methods of heating and ventilation were adopted in a school, it was important that the officers of the school, as well as the caretaker and engineer, be instructed how to use the apparatus intelligently. One of the rules of the Board of Education stated that a thermometer should be in every room (p. 8, rule 32, form 1904). This seemingly unimportant regulation or suggestion was conspicuously disobeyed. The rule should further state that the following registers of the temperature should be made daily:—

1. By the caretaker before lighting the furnaces or fires.

2. By the headmaster at the first moment of assembly in the classroom.

3. By the headmaster at the luncheon interval.

A form supplied for this purpose should soon give valuable results. Every schoolmaster would know if the system adopted were satisfactory or not and also the moment it got out of order.

The Design of Windows.

The greatest factors in ventilation under ordinary circumstances were properly designed windows. In following the rules hereinbefore expressly laid down these further additional hints would be useful:—A sash-window was the best form to use, with a fanlight at the top. This gave ventilation at four points in a height of from 6ft. to 8ft., according to the height of the room. A vertical sill-board was useful to prevent draughts at the bottom; and if the fanlight's fall were glazed, side-pieces or cheeks

were desirable to obviate down-draught. The amount of window-space to be opened must vary in the different rooms, owing to the vacillation of our climate. But each child should receive 2,000 cub. ft. of new air per hour. In addition to this, further inlet ventilation was necessary by means of long Tobin tubes, the air entering at the floor level and discharging into the room up screwed shafts 6ft. long through "shutable" lids. The outlet should be by means of ordinary fireplaces, by separate flues properly proportioned to the size of the room and of the inlets and aided by electric fans, or by ceiling trunks aided in the same way or by a coil of pipes; ventilating radiators were liable to send draughts along the floor, and, moreover, if hot water were used in the radiators there was danger in frosty weather.

PLANNING OF ELEMENTARY SCHOOLS.

Mr. A. A. Kemp, J.P., read a paper on the planning and extension of elementary schools in rural and urban districts. In regard to the site, he said care should be taken that the altitude of the land was well above the storm-level of any stream in the neighbourhood, and, if possible, where a district was not sewered it should be in a position so that an effluent pipe could be carried from any scheme that might be adopted for treating the drainage to an open watercourse.

The best arrangement of the buildings, particularly for infant schools, was to group the classrooms around a central hall, with cloak-rooms on each end with flat roofs; the central hall being lighted above the cloak-room roof with large gable lights. This was much better than a lantern light in the roof, both as regards light and ventilation.

Heating and Ventilation.

This question had been so often discussed that little was left to add. In large schools heating by hot water on the low-pressure system was the best that could be adopted for even temperature, cleanliness and economy. The first cost was not much more than that of ventilating stoves, and the excess was soon saved by the reduction in the expenditure on fuel.

Speaking of ventilation, he said he had found many large schools ventilated by the windows only. This he considered an inefficient system. It caused draughts and was an inducement to the teacher having charge of the classroom to close the window, thus shutting out the supply of fresh air and preventing the exit of the vitiated air. To obviate this difficulty it was the practice in many cases to fix at the bottom of the sash-frames

A Deep Glazed Panel.

giving, when the sash was opened the depth of the panel at the bottom, a space between the meeting rails which acted as an air inlet. This failed to be as effective as it might be, for the air inlet was in this instance about 8ft. from the floor level, and the most suitable air inlets were those which were fixed from 5ft. 6ins. above the floor line and made in the form of a hopper. Vitiated-air plates should be fixed in the ceiling and connected with a tube to some efficient ridge ventilator in the roof. There were many manufacturers of these, so that no difficulty should be experienced in obtaining them.

Another Simple Form of an Extract Ventilator

could be formed by building in glass louvres in each gable; the ceiling plate in this case was covered with a rough interlocking hood, which prevented any chance of down-draught. Many people were in the habit of using a special ventilator, and were of opinion that no other was efficient; but his own view was that a building could be thoroughly ventilated without going in for any costly special appliances.

Construction of Walls.

The code set out by the Board of Education as to the construction of walls provided that they should be solid and not less than 14ins. thick; where hollow walls were used, one portion was to have the full thickness required for solid walls. This he considered wasteful, particularly when the building was only one storey high. In many instances the wall did not exceed 14ft. in height, and would be quite safe if erected with two casings, 9ins. inside and 4½ins. outside, tied together with galvanized iron ties. This particularly referred to buildings in exposed positions, as in every case where 14in. solid walls were used there were portions of the wall which were always damp, thus causing an unhealthy building. The cost of the work would prohibit the walls being built with 14in. inner casing and 4½in. outer casing, as the code set out.

Inside Facing of Walls.

The inside of the walls should be faced dado high with glazed bricks, or some other suitable material which could be easily washed down and kept clean and sanitary. The walls above dado level should be faced with Portland cement faced with Keene's, and afterwards painted with indestructible paint, which likewise could be washed down and kept sanitary. All internal and external angles to walls, floors and ceilings should be formed with hollows and rounds at corners, thus preventing dust accumulating in the interior angles, also giving better facilities for sweeping the dust away from the intersections of floor and walls. Care should be taken that projecting ornamental mouldings, cornices and architraves were not introduced more than necessary in the interior of school buildings, as they only harboured dust and bacteria, which should be avoided as much as possible.

STOVES AND FIREGRATES.

By Henry Adams, M.I.C.E., M.I.M.E., F.S.I., F.R.S.I.

In a paper on smoke abatement which he read before the Congress Prof. Henry Adams, M.I.C.E., M.I.M.E., F.S.I., F.R.S.I., made extended reference to the various types of stoves and firegrates. Speaking first of warm-air stoves, he said

The Galton Stove,

designed in 1859 by Captain Galton, R.E., afterwards Sir Douglas Galton, chairman of the Sanitary Institute before it gained the prefix "Royal," had a cast-iron body and smoke-bend, both fitted with gills, thick fire-clay around the coals and a device for burning the smoke and gases. This required a special air-flue in the chimney-breast, and a special lintel, usually a stone, to the fire-place recess. It was designed for Army barracks on plain lines, and was not good-looking enough for rooms where appearance counted. In barracks one or more outlet flues were built in the ceiling at the end of the room farthest from the fire.

Boyd's Hygiastic Grate.

In this grate, designed by Pritchett, an architect, and brought out about 1871, the body was of three fireclay slabs—one to the back and one to each side—bevelled at the corner joints, and bedded in plaster against a stout sheet-iron case screwed to the cast-iron front frame. The warm-air grating, fitted with a shutter, was at the top of the frame, and the heated air passed to it by an open-ended box that divided it from the smoke, the shutter being the box lid. It was not very easy to fix, iron bars being needed to hold up the bricks, which also rested on the top edges of the body-slabs and butted against the back of the air-box; but the need of a trained man to fix it was its only drawback, for it could not be damaged by

reckless firing, and it gave no taint to the air, as too hot cast-iron did.

Boyd's newer Patent "Fresh-air Ventilating Grate"

stood independently in a fireplace, the whole of its surface being utilized for introducing fresh external air moderately and safely warmed, while at the same time it drew off the vitiated air of the room in proportion to the amount of pure air admitted. The heating surfaces of the sides of the body were trebled by means of gills on them, the back being left smooth to facilitate cleaning the warming chamber. The fuel chamber had thick cast-iron linings for its protection as well as to prevent the air being overheated, and these could be easily renewed without disturbing the grate itself. The bottom grating inclined upwards at the back to economize the fuel, the combustion being under control by a regulating ash-pit. The fresh air was introduced into the warming chamber by means of a conduit from out-of-doors and through openings in the hearth fitted with valves for regulating the supply.

The "Manchester" Grate,

made by Messrs. E. H. Shorland & Brother, was obtainable in two classes: the older one, with air-flues, often of glazed pipe, on each side of the smoke-flue in the chimney-breast, to conduct the heated air from the chamber around the grate body to the gratings, 8ft. to 10ft. above the floor; and the newer one, which discharged the air from the chamber direct into the room through openings in the canopy or front below the mantelpiece. The grate could be fixed by any bricklayer who was a fair workman. The air-passages were smaller and the volume of air delivered was less than those of its rivals, but all the air was thoroughly heated. This grate was made in patterns suitable to any building, and could be relied on to warm and ventilate a room when no old-fashioned extracting cowls and inlet panels were used as well.

Grundy's Patent "Warm-air Ventilating Firegrate"

was semicircular in plan, with gills behind and smoke-nozzle on top, all cast in one piece. It could be used with any design of register stove front. The cold air was admitted from behind the grate at the bottom, and the warm air was conveyed into the room by means of gratings fixed in the chimney-breast.

The "Teale" Grate,

invented about 1880 by Mr. Pridgin Teale, an oculist, was made of thick fireclay slabs, one of which sloped forward over the coals, with thin front bars to hold in the coal and let out the radiance, and a shutter or "economizer" to close up the air and ash-space below the bottom grating. A modernized form was Florence's patent, where a flue passed from the centre of the fire through the fireclay slab and up between the inclined slab and the iron back, a hinged front permitting the use of either the front or the back of the sloping slab for the passage of the products of combustion.

Overheating.

In warming the air of a room care must be taken not to burn it, or, to be more accurate, not to burn the organic particles suspended in the air, which would produce an objectionable odour; and there was another reason against overheating, namely, the air would not contain a fair proportion of moisture compared with its temperature. Where there was a doubt, a sufficient water surface should be exposed connected with the warming apparatus.

Close Fires or Stoves

were used more for churches, public halls, schools and railway waiting-rooms than for private use. They generally stood out from the wall, so that the heat was radiated all round, and the sides had projecting ribs or gills to increase the radiating surface (and

therefore the quantity of heat) and to reduce its intensity. Messrs. Musgrave Brothers, of Belfast, made one of the best patterns; for instance, their No. 3 size, 2ft. 4ins. by 2ft. by 3ft. 3ins. high, would effectually warm a space of 36,000 cub. ft. The Goldsworthy-Gurney stove, somewhat similar but circular, and standing in a pan of water, had been also largely used. Size C, 31ins. diameter, would warm a space of 30,000 cub. ft. When the stove was to be placed in an underground chamber a large furnace was commonly constructed with cast-iron sides and top, having extra large gills, as made by Messrs. Smith & Sons, of Barnard Castle, Durham; or an arrangement of flattened pipes laid backwards and forwards, through the interior of which the furnace gases passed while the fresh air travelled between the various pipes, as made by Mr. John Grundy, of Duncan Terrace, Islington.

Two sets of tests were made by the Coal Smoke Abatement Society upon domestic open firegrates in 1901-1903. In the first the "Florence" grate came out best; and in the second, with another group of grates, the "Tropicana" came out best—that was to say, produced the maximum of heat with the minimum of coal consumption and smoke.

"The Florence" Grate

was made by the London Warming and Ventilating Co., Ltd., and was described as fitted with improved "Jackson" back, Florence's patent automatic shaking fire-bars and combination canopy regulator. Its size was 21ins. by 28ins. The back and sides were of firebrick. It had a fire-chamber of 18ins. and a front of vertical iron bars. In each jamb at the hearth level there was a fresh-air inlet, and there was a heated-air outlet over the centre of the fireplace 6ft. above the floor level. The "Jackson" back and combination canopy regulator consisted of a sliding-door capable of easy manipulation from the front, which in its two positions allowed a careful regulation or adjustment of the two slotted openings—the one at the back of the firegrate and the other at the top. The smoke was drawn through the fire to a point where the heat was practically incandescent, and was consumed to a very appreciable extent. The automatic shaking bars consisted of a number of separate bars, preferably serrated or vandyked on their sides and upper surfaces. These were mounted loosely on a square shaft, so that the bars could rock to a limited extent on the shaft or could be rocked by operating the shaft by a handle. The bars were made abnormally deep in the body to heat the ascending air-currents. As the weight of the coal varied on the different bars, the bars would rock and clear the fire of ashes and dust, so allowing a continuous current of air at a high temperature to pass through the fuel, which caused it to burn brightly even in small quantities.

The "Tropicana" Grate

was owned by Messrs. Chavasse & Kerr, of Birmingham. The backs were of firebrick, usually with a corrugated front, and of vertical construction. The fire rested on a metal bottom, raised above the hearth, so that the heat might not be lost by conducting under the floor, and the ashes could be removed without extinguishing the fire. The bottom was so constructed that by means of a detached shutter the air could be entirely prevented from passing through the fire. To overcome the stagnation which would naturally ensue, a suction draught was introduced into the chimney through narrow passages formed in the brickwork. The air passing up these passages was heated by coming in contact with the firebrick, and was thus rarefied. The motive in this arrangement was to attain a more complete surface combustion, and to reserve and to utilize all the front heat generated in the

fire for radiation, while a small quantity of heat behind, which would otherwise be wasted, sufficed to stimulate a steady and reliable draught from the room through the chimney. A large radiating surface was employed, and canopies were discarded as unnecessary where this system was applied, there being no trouble from smoke. The inventors claimed that canopies were most detrimental to the heating power of any grate, and that the choice in grates where they were necessary was generally between a cold room and a smoky one. The fire in the "Tropicana" grate maintained for many hours a brilliant and glowing heat without perceptibly wasting away.

We had, therefore, said Professor Adams, a choice of good things, and there might be many others equally good which he had not mentioned, so that as far as domestic appliances were concerned we were endeavouring to secure a purer atmosphere.

ILLICIT COMMISSIONS.

Sanitary Inspector Suspended.

At a meeting of the Marylebone Borough Council last week a report was presented by a committee appointed to enquire into alleged irregularities on the part of certain sanitary inspectors in the service of the council. The committee reported that very serious allegations were made by a builder against one of the sanitary inspectors. The builder alleged that the inspector had been in the habit of recommending him to different persons requiring work to be done, and insisting on a commission being paid to him in respect of such orders, which commission was added to the contract price. It was represented that this practice continued from the year 1898 to 1902, when, in consequence of a dispute which the builder had with the inspector about the amount of some commission, the builder did not receive any more recommendations. The builder stated that all these payments were made in cash or notes, and he handed in a statement of eleven jobs, amounting to £906, in respect of which he alleged he paid the sanitary inspector £240. The inspector emphatically denied all these allegations, but admitted the existence of financial transactions between himself and the builder.

A resolution was passed that the sanitary inspector be suspended and the facts be reported to the Local Government Board. Mr. E. White intimated that he intended to send the evidence to the Attorney-General, with request to sanction a prosecution of the builder under the Public Bodies Corrupt Practices Act of 1889.

Law Cases.

Action against Welsh Architects.—At the Chester Assizes recently Mr. Justice Phillimore and a special jury heard an action brought by Mrs. Barnato, widow of the late Mr. Barney Barnato, against Messrs. Chadwick & Booth, architects, of Colwyn Bay. The plaintiff claimed damages from the defendants for alleged negligence in the supervision of the construction of a wall around her property at Colwyn Bay. The defendants counterclaimed 14 guineas fees in connection with the wall and commission on plans of a house, estimated to cost £4,000, prepared for Mrs. Barnato. The jury were two hours considering their verdict. They found that the defendants had been guilty of negligence and that the wall must be pulled down. They awarded the plaintiff £200 damages. On the counterclaim for £300, being 7½ per cent. commission for plans of a house estimated to cost £4,000, they awarded the defendants £80.

out, can he claim in the county court for the remaining £5, or does the fact of A writing on the face of the cheque 'in full settlement' preclude B from recovering the balance?"

If A has written "in full settlement of all claims" on the cheque, and B endorses it, we do not think B can have any further claim, because the endorsement is a tacit acknowledgment of what is stated on the other side of the cheque. We think, however, if B includes in the endorsement that the £17 is only on account, and that £5 is still due, he is in a position to take out a county-court claim for this amount.

Claim for Work Done but Omitted in Quantities.

ALPHA writes: "I am having some difficulty with an architect respecting work that was needed to complete a job as per drawings and specification, and was missed entirely, or understated, by the quantity surveyor. The job was taken at a very close profit. It was only a £3,000 contract, and the quantity surveyor's errors amount to more than £40. The quantity surveyor, although paid by the builder out of the first certificate, was employed either by the owner or by the architect—I have no means of finding out which, though I suspect it was the architect. The quantities are not part of the contract. Now the work is completed, I have sent in my account, but the architect has ignored those items which should have been provided in the quantities bill, but were not. If the architect can find any item in the quantities bill that is overstated I am quite willing for it to be deducted, but my experience teaches me that the errors of quantity surveyors are more often against the builder than otherwise. Am I legally entitled to be paid for the work? As the quantity surveyor is the servant of the owner or of the architect, are these two not responsible for the quantity surveyor's errors, as I am for my servants and employees? The quantity surveyor has been paid some months since, according to the conditions, and apparently I have no hold on him."

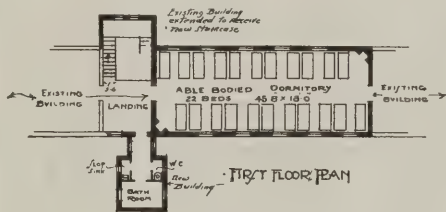
Your position in the matter is unfortunate, and we fear you have no redress. The contract being based on the drawings and specification alone, the fact that the quantities are incorrect does not vitiate it. Nor is the quantity surveyor liable. "Notwithstanding that the builder may become, as above explained, liable to the quantity surveyor for his fees and disbursements, the latter is under no liability to him for errors in the bill of quantities made without fraud" (A. Houston, K.C., in "Specification, No. 4"). We should think that the architect, if an honourable man, would endeavour to save a builder from the consequences of error by the quantity surveyor. But in law the latter is either a servant of the architect or of the building owner, unless the architect takes out his own quantities. The onus of seeing that the plans, specifications and quantities all agree is always laid upon the builder. We should advise you to see what you can do to move the architect.

Planning and Fitment of Workhouse.

LONDON.—F. C. writes: "It is proposed to pull down an old building in the centre of an existing part of a workhouse in the country, at present used for various trades by the paupers, and which gives a length of 48ft., and to erect in its place a dormitory or ward on the ground floor for infirm male paupers, 18ft. wide by 12ft. high, and over same on first floor a similar ward, say 10ft. high, for able-bodied paupers. In some cases the infirm would occupy the ward day and night. The wards face east and west. How many beds could be placed in each ward, the same being in two rows opposite each other? What distance should the beds be

placed apart, and what width are the beds? What is the best spacing of windows, and how many, if 3ft. by 8ft. 6ins. each, would be correct, built as for hospitals? Are the two fireplaces better placed one in each angle of either the end walls (north or south) or one at each end in the centre, or one in the angle of the building at either end? An entrance will be arranged for one in each end wall from the existing lobby. There is a staircase at either end of the existing building which would adjoin the proposed new building, constructed of wood, badly arranged, and no conveniences. Would it not be better to remove the two staircases, and give the space as an entrance or lobby, and build out in the rear new stone staircases and conveniences approached from the said lobbies in front and with door from staircases into yard at rear?"

After making allowance for new walls you will obtain a dormitory 45ft. 8ins. long. The following amount of space per bed, irrespective of that occupied by doors and fireplaces, is required by the Local Government Board:—For aged infirm, 5ft. wall space and 50ft. super. floor space; for able-bodied inmates, 4ft. and 34ft. respectively. It will be seen from the sketch plan below that you obtain on the ground floor sixteen beds for the infirm and on the first floor twenty-two beds for the able-bodied. The beds generally used are 2ft. 6ins. by 6ft. long, and they should be arranged to stand in their respective superficial amount of floor space. All dormitories over 30ft. in length require two fireplaces. In this case I suggest they be placed in the angles of the dormitory. The windows should be arranged as shown upon the plan, the sill



being about 3ft. above the floor and the frame extending to within gins. of the ceiling. It is most essential that the existing wood staircases be removed and in place thereof a new stone staircase provided. On one side of the existing lobby an annex may be arranged having lavatory accommodation on the ground floor and a slop sink, w.c. and bath on the first floor.

ALBERT C. FREEMAN.

[A recent book on the subject is Mr. Freeman's "Planning of Poor Law Buildings and Mortuaries" (7s. 6d. post free from these offices).

Building Dictionaries.

SHEFFIELD.—D. H. writes: "Is there a book published giving the technical terms used in building?"

There are several, such as Russell Sturgis's "Dictionary of Architecture and Building" (3 vols., 75s.) and Burns's "Glossary of Technical Terms used in Architecture and the Building Trades" (3s. 6d.). A glossary of building terms will also be found in "Specification, No. 3."

Heat Passing from One Floor to Another.

BIRMINGHAM.—ENQUIRER writes: "Is there any way of keeping the heat from penetrating through a ceiling into my office, as the rooms over have to be heated up to 200 degs. Fahr., and as there is only a 4½ in. cement-concrete floor between, the heat naturally comes through? Is there any plaster that could be used on the ceiling underneath to reduce this temperature, say, to 60 degs. Fahr. in my offices, or could anything be applied on the

floor over; or if the cement-concrete floor were to be taken out entirely, what would be the best floor to put in to prevent the unbearable heat?"

In our opinion the best thing you can do is to erect a false ceiling and pack between with slag-wool. No plaster would be effective.

Buildings to Measure on the Isle of Wight.

B. writes: "What buildings on the Isle of Wight are worth visiting in an architectural way?"

See the reply on p. 39 of our issue for August 19th, 1903.

Architects Abroad and in the Colonies.

LIVERPOOL.—W. H. W. writes: "I am an architect's assistant and have been out of a situation for six months. As there is no appearance of things changing for the better, I should be glad to know if there is any chance of getting a position abroad or in the Colonies."

As a rule, situations abroad or in the Colonies are to be obtained only by direct application on the spot, and we do not think you would be wise to go out on the off-chance. We have replied to similar enquiries before, as you will see by consulting back numbers. We can offer you no other advice than to advertise and to keep in touch with situations offered.

Stone Church: Drawings for the Academy.

SOMERSET.—PEN writes: "(1) Please give a short description of Stone Church, Kent. (2) What are the conditions to be complied with in submitting architectural drawings to the Royal Academy? Must the drawing be of a building, &c., already erected, or would one of a proposed building be accepted?"

(1) An illustrated description of Stone Church will be found in our issue for October 4th, 1899. (2) The drawing may be of a building erected or of one proposed. All drawings must be in gilt frames and have the title and the name and address of the architect on the back and on a label hung over the front. Full particulars can be obtained from the secretary of the Royal Academy at Burlington House, Piccadilly, London, from whom also labels can be obtained after a specified date.

Alleged Damage to a House.

CROYDON.—CONSTANT READER writes: "The owner of the property adjoining mine dug the ground out on top of my footings at the side of my fence, and left the road, which is 9ft. gins. wide, with a fall of gins., so that the water accumulated and ran back into my house at the ground level all along my flank walls. I took proceedings for an injunction—with what result you will see from the newspaper cuttings I send. Can you advise me what to do next?"

You are certainly in an unfortunate position, but in the face of the very clear judgment given I cannot advise any further legal proceedings (unless some fresh circumstances should arise in the future). You would, in my opinion, be only "throwing good money after bad."

F. S. I.

Angle of Slope for Coals.

IPSWICH.—C. C. writes: "What is the sliding angle of coals?"

Coals may be stacked with vertical walls, as in locomotive yards, where suitable lumps are used on the outside and the top layer is painted round with whitewash to show more readily that it has not been tampered with. Ordinary coals, left free, will stand at an average angle of 40 degs. from the horizontal, the exact angle depending upon the variety and size of the coal; in this condition it acts exactly like earth in producing a thrust against any wall or barricade retaining it. For coals to run down a screen to remove

the dust the average angle is 36 degs.; if they are damp they will run sluggishly, and if dry they will run freely. In a similar way an angle of 26 degs., or slope of 6in. in 1ft., is the average for a smooth iron or steel chute and 30 degs. for a wooden chute. Solid coal is estimated to measure about 40 cub. ft. per ton; coal stores are usually reckoned at 45 cub. ft. per ton; while the Navy allowance for bunkers is 48 cub. ft. per ton. By actual testing, a coal bucket of the nominal capacity of 18 cwt., and with an actual capacity of 35 cub. ft., will lift 16 cwt. best house coal, 18 cwt. gas coal and 23 cwt. Welsh steam coal; so that in any design the figures used must depend upon the class of coal to be handled. HENRY ADAMS.

The Martello Towers.

SOUTH WOODFORD.—"Is there a book published giving plans and particulars of the martello towers on the Kentish coast?"

We have made enquiries, but have failed to find any book containing illustrations of these towers.

Buildings to Measure near Whitby.

DARLINGTON.—IONIC writes: "Please give me a list of the chief architectural works of interest suitable to measure in or within a few miles of Whitby."

St. Helen's Abbey at Whitby affords plenty of Early English and Decorated features suitable for measuring: Near the abbey, on the edge of the cliff, is a fine Norman church, while Whitby Hall, a sixteenth-century mansion (restored), stands upon the site of the abbot's residence. At Ugglebarnby there is a church the greater part of which is Norman with later additions. The Norman fortress, Mulgrave Castle, is $3\frac{1}{2}$ miles from Whitby and is well worth a visit. Scalby is easily reached by rail, at which place an Early English church is to be found, and Scarborough, a few miles south of the last-mentioned town, possesses a fine castle and a church dedicated to St. Mary which contains work of a style transitional between Norman and Early English, as well as some pure Early English work. H. Y. M.

Obtaining an Appointment.

MANCHESTER.—SURVEY writes: "Please advise me as to obtaining a public appointment of some description. I am twenty-seven years of age and in an architect and surveyor's office. I have passed in the following subjects:—Carpentry and Joinery (Preliminary and Ordinary), Building Construction (Elementary and Advanced), Builders' Quantities (Ordinary and Honours), Surveying and Levelling, Sanitary Inspectors' Examination of the Royal Sanitary Institute, Institute of Sanitary Engineers' Examination. Is this sufficient to enable me to obtain a public appointment as district surveyor or assistant, or would you advise me to go in for the A.M.I.C.E. or Municipal Engineers, or F.S.I.? Which is best? Do you think with what I have already passed I should stand a good chance of passing? I am not a really good architectural draughtsman, and having little chance of starting on my own account I desire a permanent berth. Kindly say where particulars of examinations can be obtained."

The certificates named are sufficient for many appointments, but the difficulty is to obtain one. Except for the Civil Service appointments, it may be said that local influence is essential, but occasionally a stranger is appointed upon his merits, or rather upon his testimonials, which sometimes "are not what they seem." The best advice that can be given is to keep a vigilant look-out for all vacancies and to try for every suitable one; in the meantime to go on gaining practical experience and pass such examinations as are within the range of previous studies. The Municipal and County Engineers' examination would seem to be

the next one to take up; particulars may be obtained from the secretary, 11, Victoria Street, Westminster, S.W. After that the A.M.I.C.E. examination may be tried, but there is a great gulf between the two examinations that may be too wide to bridge. Particulars of the latter examinations may be obtained from the secretary, Institution of Civil Engineers, 25, Great George Street, Westminster, S.W. HENRY ADAMS.

GREEK RULES OF PROPORTION.

IN constructing their stone edifices the Greeks, who were reasoners and logicians, followed certain rules, and adopted for each edifice a certain fixed proportion. Take as an example the temple of Pæstum. The module is the mean radius of the column. This module measures 3ft. The column is ten times the module, or, say, 30ft. The distance between the axes of the column is five times the module, say 15ft. The total height of the entablature is also 15ft. The width of the abacus is three modules, equal to 9ft. Thus it is seen that all these numbers are multiples of three, which is the module. In this manner the proportions of the different members of an edifice have a constant relation to each other. It goes without saying that the module varies for each edifice; there is no single and absolute rule. For instance, in the Doric order the length of the column varies from ten to twelve modules; in the Ionic order from sixteen to twenty-one. The entablature of the Doric order measures five modules, and that of the Ionic only four.—(Jean Schoepfer, in the "Architectural Record Magazine" of New York.)

NO-BY-LAW COTTAGES.

The Absurdities in Present Regulations.

IN a second article on anti-building by-laws in the "Bournemouth Directory" Mr. R. M. Lucas, F.R.I.B.A., says: "To realize how very much the by-laws have lowered the standard of building one should search for a recently-built cottage of two storeys having walls thicker than the ordinary hollow 11in. Every one that I can think of belongs to the no-by-law period; and so do practically all of those whose beams are oak and whose roofs are close-laid tile. Cottage building has been reduced to the meanest possible. For centuries—in fact ever since building began—it steadily improved in response to the growing knowledge and the common-sense demands of the public, met by the enterprise of the builders. But now, where it is not absolutely at an end, it is only just above a set standard, and that a low one. Enterprise no longer influences the builder. And the reason of this wretched state of things is that by-laws prohibit the exercise of discretion by insisting on the unnecessary as well as on the necessary. Thus it comes about that a builder is in the position of a man who is told that every article of his clothing must cost the same price—if his boots cost £1, his coat must cost £1 and his hat £1. There must be no 3s. boots for hard tramping and no 5s. straw hats for hot sun! So that designer who can often distribute a given amount of brickwork to the advantage of the building's stability by thickening out here and thinning down there, is prevented from making use of its ingenuity, for the by-laws prohibit this by insisting on one least thickness everywhere. Builders are even forced to submit to an absurd interpretation of a by-law that no longer exists, in the case of walls that happen to rise above an adjoining building, such as a lean-to larder. Such walls are actually declared to be external throughout and are required to be built of

extra thickness in consequence in the lower storey, in defiance of the fact that this lower part, being enclosed, might be omitted altogether and the upper part supported by a girder, just as in the case of a bay window. . . . The very latest folly (quite recently evolved and of local growth) is to insist on party-walls being carried right through the cavities of the front and back external walls, apparently in order to make sure of letting in the damp. Prevention of fire is, I believe, the reason alleged—as if the very remote chance of fire spreading horizontally in a cavity-wall could not be dealt with in other ways. . . ."

THE BUILDINGS OF CALCUTTA.

CALCUTTA rather prides itself on being a city of palaces, and the fine mansions along Chowringhi may encourage the illusion. But the capital of India, less fortunate than Bombay, never had a Bartle Frere to embellish it, and too many public edifices of Calcutta are little better than imitations, says the "Standard." Government House is copied from Kedleston Hall, Derbyshire; the High Court was built on the model of the town hall at Ypres; Metcalfe Hall reproduces a portion of the Temple of the Winds at Athens. Nor, perhaps, are the pure Doric of the town hall at Calcutta and the Hindu-Gothic of the cathedral altogether suitable to their surroundings. But the Victoria Memorial Hall, designed by Sir William Emerson, will be the finest modern building in all India; and, in other ways, too, Lord Curzon will leave his mark on Calcutta. The plans for the improvement of Dalhousie Square doubtless owe much to his inspiration. An expert in landscape gardening who was consulted by the Bengal Government was in favour of removing the Dalhousie Institute, which, he thought, "interfered seriously with the artistic readjustment of the gardens," but this recommendation has not been accepted.

MONUMENTS IN JEOPARDY.

LORD WEMYSS, writing to the "Times," points out that Acts have been passed for the protection of ancient monuments, yet, strange to say, our cathedrals are left without legislative protection and are wholly at the mercy of their respective deans. The power of the dean is supreme, checked only by public opinion. Thus a few years ago the Dean of St. Paul's, Dean Gregory, took that building in hand, and Sir W. Richmond, R.A., was employed to cover the roof of the chancel of Sir Christopher Wren's great Renaissance work with Byzantine mosaics, for which the original stonework had in parts to be cut away. The walls also were decorated (!) by black stencilling around the arches. These stencillings, happily, remonstrant public opinion caused to be removed, and the stencilling hand of the Dean was stopped. "And now we have the Dean of Westminster removing and mutilating a monument erected in the Abbey by Parliament in honour of a gallant sailor—Captain Cornewall—who, having in the sea fight before Toulon had both his legs cut off by a chain shot, fought on while life remained to him. There is, unfortunately, no means of stopping the Dean's action save public opinion. His Majesty's Office of Works and Parliament are alike powerless. Now this practical destruction of an ancient monument is said to be caused by the necessity of finding in the Abbey space for a recumbent figure of the late Lord Salisbury. But if ancient historic monuments are thus, when a site is required for a modern statue, to be destroyed or mutilated and removed, where is this vandalism to stop?"

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
Aug. 3	Crieff, N.B.—Post-office	Commissioners	Postmaster, Crieff.
" 3	Rotherham—Extension of Laundry	Guardians	H. L. Tacon, 11 Westgate, Rotherham.
" 3	Wakefield—Alterations at School	Education Committee	J. Vickers-Edwards, County Hall, Wakefield.
" 4	Edinburgh—Works	Scottish Fish, Oil & Guano Co.	Carmichael & Sharman, 14 Queen Street, Edinburgh.
" 4	London, E.—Additions to Shoreditch County Court	Commissioners	J. B. Westcott, H.M. Office of Works, Storey's Gate.
" 4	Southwold—Sea Defence Works	—	E. R. Cooper, Town Clerk, Southwold.
" 4	Bonnybridge, N.B.—Works	—	Carmichael & Sharman, 12 Queen Street, Edinburgh.
" 4	Nantymoel—Alteration to Chapel	—	W. B. Rees, 3 Dumfries Place, Cardiff.
" 5	St. Erme, Cornwall—Piggery, &c.	—	Farmhouse, Tregasson, St. Erme.
" 5	Sheffield—School	Education Committee	Secretary, Education Committee, Education Offices, Sheffield.
" 5	East Harling—Mortuary Chapel	Parish Council	Clerk to Burial Authority, East Harling.
" 5	London, S.E.—Alterations to Engineering Arrangements	Metropolitan Asylums Board	Office of Board, Embankment, E.C.
" 5	Wath-upon-Deane, Yorks—Alterations and Asphalting	Education Committee	J. V. Edward, County Hall, Wakefield.
" 5	Ynysboeth—Nine Houses	Building Co.	T. W. Jones, Cynon Chambers, Aberystwyth.
" 7	Nuneaton—Re-building Chancel	—	Vestry, St. Mary's Abbey Church, Nuneaton.
" 7	Gorseinon, Swansea—Six Cottages	—	C. T. Ruthin, Bank Chambers, Heathfield Street, Swansea.
" 7	Lingfield, Surrey—Alterations to School	Education Committee	Jarvis & Richards, 36 Victoria Street, S.W.
" 7	Partick—Fire-brigade Station	Town Council	J. Miller, 15 Blythswood Square, Glasgow.
" 7	Kemnay—Alterations to School	School Board	Kelly & Nichol, 367 Union Street, Aberdeen.
" 8	Portumna—Bank Premises	Hibernian Bank, Ltd.	Bryne & Son, 20 Suffolk Street, Dublin.
" 8	Chiswick, W.—Repairs to Houses	Urban District Council	J. Barclay, Town Hall, Chiswick.
" 8	Newton Abbot—Nursery	Guardians	S. Segar, Union Street, Newton Abbot.
" 8	Glossop—Alterations to Police-station	Corporation	R. G. Hawke, Norfolk Square, Glossop.
" 8	London, W.—Shed	G.W. & Metrop. Railways Co.'s	Engineer, Great Western Railway Co., Paddington, W.
" 8	Barnes, Chapel	Urban District Council	R. B. Rowell, Triangle Corner, East Sheen, Surrey.
" 9	Hensworth, Wakefield—School	Education Committee	W. E. Richardson, Rothwell, near Leeds.
" 9	Clydach Vale, Wales—Alterations to Chapel	Trustees	R. S. Griffiths, Tonypandy.
" 9	Dungarvan, Ireland—Cells, &c.	—	Office of Public Works, Dublin.
" 12	Walsall Wood, Staffs—School	Education Committee	G. Balfour, Director of Education, Stafford.
" 12	Ryde, Isle of Wight—Cottages	Corporation	Borough Engineer, Town Hall, Ryde.
" 12	Britthdir, Merthyr Tydfil—Repairing 100 Houses	Dwellings Supply Co.	C. M. Davies, Merthyr Tydfil.
" 12	Stafford—School, &c.	Education Committee	Committee's Offices, Stafford.
" 14	Burrington, Devon—Restoration of Farmhouse, &c.	—	J. Hannaford & Son, Chulmleigh.
" 14	Maidbury, Woking—School	Education Committee	Jarvis & Richards, 36 Victoria Street, S.W.
" 15	Sudbury—Classroom	Education Committee	Committee Offices, 5 Crown Street, Bury St. Edmunds.
" 15	Minehead—Hospital	District Hospital Committee	J. R. Davis, 18 The Avenue, Minehead.
" 15	Hampton, Middlesex—Fire-station, &c.	Urban District Council	S. H. Chambers, Public Offices, Hampton.
" 16	Barnet, Herts—Additions to Workhouse	Guardians	White, Son & Pill, 13 High Street, Barnet.
" 16	Fernhurst, near Haslemere—House	J. Casar	M. Childs, Bridgeland, Fernhurst.
" 18	Downpatrick, Ireland—House	Lunatic Asylum Committee	Asylum, Down.
" 26	Macclesfield—School	Education Committee	J. F. May, 43 Church Side, Macclesfield.
" 31	New Romney, Kent—Re-slating Roof of Town Hall	Town Council	Borough Surveyor, New Romney.
ENGINEERING:			
Aug. 3	Belfast—Meters	Corporation	Sir S. Black, Town Clerk, Belfast.
" 4	Southampton—Pumping Engines	Corporation	J. A. Crowther, Market Chambers, 123 High Street, Southampton.
" 4	Southwold, Sussex—Sea Defence Works	—	E. R. Cooper, Town Clerk, Southwold.
" 5	Ipswich—Boiler	Guardians	R. J. Kent, 19 Tower Street, Ipswich.
" 7	Ebbw Vale, Mon.—Cables	Urban District Council	R. P. Wilson, 66 Victoria Street, S.W.
" 7	Withnell, Lancs—Gas Plant	Urban District Council	J. Carr, Farnworth, Widnes.
" 8	Middleton, Lancs—Heating Apparatus	Corporation	W. Welburn, Borough Surveyor.
" 9	Belfast—Gas Cookers	Gas Committee	Sir S. Black, Town Clerk, Belfast.
" 9	Braintree, Essex—Water Main	Urban District Council	H. H. Nankivell, Surveyor's Office, Vestry Hall, Braintree.
" 10	Fleetwood, Lancs—Gas Engines	Urban District Council	G. R. Strachan, 9 Victoria Street, S.W.
" 11	Droitwich—Water Mains	Borough Council	A. Hulse, Borough Surveyor, Droitwich.
" 12	Bishop's Stortford—Pumping Engine	Urban District Council	T. Swatheridge, Council Offices, 7 North Street, Bishop's Stortford.
" 14	Appleby, Lincs—Reservoir	Urban District Council	A. Atkinson, Brigg.
" 14	Carlisle—Reservoir	Corporation	J. Mansergh & Sons, 5, Victoria Street, S.W.
" 14	Lymington—Concrete and Oak Bridge	Rural District Council	J. D. Rawlings, 38 High Street, Lymington.
" 16	Amsterdam—Axles	Commercial Intelligence Branch of Board of Trade	M. Mart. Nighoff, Bookseller, The Hague.
" 19	Bury, Lancs—Ice Plant	Corporation	A. W. Bradley, Borough Engineer, Bury.
" 21	Skipton—Reservoir	Urban District Council	G. H. Hill & Sons, 3 Victoria Street, S.W.
Sept. 1	Merthyr Tydfil—Destructor Plant	Urban District Council	T. F. Harvey, Town Hall, Merthyr.
" 1	Wolverhampton—Pumping Engine	Corporation	E. A. B. Woodward, Town Hall, Wolverhampton.
" 4	Immingham—Dock	Directors	Sir J. Wolfe Barry & Partner, 21 Delahay Street, Westminster, S.W.
Oct. 23	Mussoorie, India—Electric Lighting and Waterworks Scheme	Municipality	C. H. Shanahan, Municipal Office, Mussoorie, India.
IRON AND STEEL:			
Aug. 8	Stretford, Manchester—Iron and Steel	Stretford Gas Co.	H. Kendrick, Gas Engineer, Gasworks, Stretford, Manchester.
" 10	Swansea—Rails	Harbour Trustees	T. Strick, Harbour Offices, Swansea.
" 12	Ryde, I.W.—Iron Fencing	Corporation	Borough Engineer, Town Hall, Ryde.
" 15	Cadell—Piping	Corporation	Graham, Rowse & Co., Mersey Chambers, Liverpool.
Oct. 9	Mussoorie, India—Pipes, &c.	Municipal Board	C. H. Shanahan, Municipal Office, Mussoorie.
PAINTING AND PLUMBING:			
Aug. 3	Belper—Painting Exterior of Workhouse	Guardians	Workhouse Master.
" 4	Sheffield—Painting and Cleaning at Depot	Highways & Sewerage Committee	C. F. Wike, Town Hall, Sheffield.
" 8	Stretford, Manchester—Paints, &c.	Gas Co.	H. Kendrick, Gas Engineer, Gasworks, Stretford, Manchester.
" 9	Nottingham—Painting at Lodge	Corporation	City Architect's Office, Nottingham.
" 25	Buckingham—Interior Renovation of School	—	G. Bennett & Son, Buckingham.
" 28	Gateshead—Cleaning and Painting at Schools	Education Committee	E. J. Harding, Education Offices, Gateshead.
ROADS AND CARTAGE:			
Aug. 3	Whickham, Durham—Paving	Urban District Council	J. B. Renton, Council Offices, Whickham.
" 3	Castleford—Street Works	Urban District Council	Mr. Green, Surveyor to Castleford.
" 4	Southampton—Stone	Corporation	J. A. Crowther, Market Chambers, 23, High Street, Southampton.
" 4	Manchester—Making-up Roads	Withington Committee	Surveyor to Committee, Town Hall, West Didsbury.
" 4	Batley, Yorks—Road Works	—	Marriott, Son & Shaw, Church Street Chambers, Dewsbury.
" 4	Grimsby—Road Works	Corporation	H. G. Whyatt, Town Hall Square, Grimsby.
" 7	Kingsclere, Berks—Hire of Steam Rollers	District Council	W. T. Jelfs, Kingsclere, Newbury.
" 7	Ebbw Vale, Mon.—Road Improvement	Urban District Council	T. J. Thomas, Surveyor, Ebbw Vale.
" 8	Southall, Middlesex—Paving Works	Urban District Council	R. Brown, Public Offices, Southall.
" 9	Litherland, Lancs—Paving &c.	Urban District Council	A. H. Carter, Public Offices, Sefton Road, Litherland.
" 9	Ticehurst, Sussex—Steam Rolling	Rural District Council	W. N. Wood, Surveyor, Ticehurst.
" 10	London, N.—Private Street Works	Finchley U.D.C.	Engineer and Surveyor, Finchley, N.
SANITARY:			
Aug. 7	Galston, N.B.—Sewage-disposal Works	Town Council	Office of Master of Works, Galston.
" 15	London, S.E.—Sanitary Work	Guardians	W. Thurnall, Guardians' Office, Brook Street, Kennington Road, S.E.
" 12	Wigan—Sewerage Works	Rural District Council	Heaton, Ralph & Heaton, King Street, Wigan.
TIMBER:			
Aug. 15	Canterbury—Oak Fencing	Sanatorium Committee	A. C. Turley, City Surveyor, Canterbury.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Sept. 23	Cheshunt—Library	—	£1 rs.	A. Collingwood Lee, Manor House, Cheshunt.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

Current Market Prices

FORAGE.

	per qr.	£ s. d.	per ton	£ s. d.
Beans	...	1 12 0	...	1 17 0
Clover, best	...	3 15 0	...	4 2 6
Hay, good	...	3 10 0	...	3 15 0
Sainfoin mixture	...	3 10 0	...	3 17 6
Straw	...	1 12 0	...	2 0 0

OILS AND PAINTS.

Castor Oil, French	per cwt.	1 0 5	—
Colza Oil, English	do.	1 2 9	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 15 0	2 17 0
Lead, white, ground, carbamate	per ton	16 0 0	—
Do. red	do.	15 0 0	—
Linseed Oil, barrels	per cwt.	0 18 10 ³	—
Petroleum, American	per gal.	0 0 5 ³	0 0 5 ³
Do. Russian	do.	0 0 5 ³	—
Pitch	per barrel	0 8 0	—
Shellac, orange	per cwt.	8 17 6	9 0 0
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Town	per cwt.	1 4 0	—
Tar, Stockholm	per barrel	1 6 6	—
Turpentine	per cwt.	2 3 6	—

METALS.

Copper, sheet, strong	per ton	82 0 0	—
Iron, Staffs., bar	do.	5 12 6	8 0 0
Do. Galvanized Corrugated sheet	do.	10 12 6	10 15 0
Lead, pig, Soft Foreign	do.	13 17 6	—
Do. do. English common brands	do.	14 5 3	—
Do. sheet English, 3lb. per sq. ft. and upwards	do.	15 0 0	—
Do. pipe	do.	16 0 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 5 0	—
Do. floor brads	do.	9 0 0	—
Steel, Staffs., Girders and Angles	do.	5 7 6	5 12 6
Do. do. Mild bars	do.	6 0 0	6 5 0
Tin, Foreign	do.	149 0 0	149 10 0
Do. English ingots	do.	149 0 0	151 10 0
Zinc, sheets, Silesian	do.	26 15 0	—
Do. do. Vieille Montaigne	do.	27 0 0	—
Do. Spelter	do.	24 0 0	24 15 0

TIMBER.

Soft Woods.

Fir, Dantzic and Memel	per load	2 15 0	5 5 0
Pine, Quebec, Yellow	do.	4 0 0	7 10 0
Do. Pitch, American	do.	3 0 0	5 0 0
Laths, log, Dantzic	per cu. fath.	4 0 0	6 0 0
Deals, Sandarne, Yellow, 3rd, 4x9	per std.	12 5 0	—
Do. Archangel, Yellow, 3rd, 3x11	do.	8 15 0	—
Do. do. do. 3x11	do.	8 15 0	8 15 0
Do. do. do. 3x9	do.	9 10 0	9 15 0
Do. Mesane, Yellow, 3rd, 3x8	do.	9 15 0	—
Do. do. do. 4th, 3x9	do.	8 15 0	—
Do. Gefte, Yellow, 3rd, 3x9	do.	10 5 0	—
Do. Skutskai, Yellow, 1st and 2nd, 3x7	do.	10 15 0	11 0 0
Do. Räfsö, Yellow, 2nd, 3x5 ¹	do.	9 0 0	—
Do. do. do. 2 ¹ x 7	do.	9 5 0	9 10 0
Do. Christiansand, Yellow, Unsorted, 3x4	do.	7 15 0	—

Deals, Skelleftea, Yellow, 1st, 2 ¹ x 7	per std.	£ s. d.	£ s. d.
Do. do. do. 2nd, 2 ¹ x 7	do.	9 10 0	—
Do. Stingsund, Yellow, 4th, 2 ¹ x 7	do.	9 5 0	—
Do. Riga, White, Unsorted, 2 ¹ x 7	do.	7 15 0	8 0 0
Do. Quebec, Spruce, 4th, 3x9	do.	8 0 0	—
Battens, all kinds	do.	6 10 0	11 10 0
Flooring Boards tin. prepared, 1st...	per square	0 10 3	0 11 0
Do. 2nd	do.	0 10 0	—
Do. 3rd, &c.	do.	0 7 3	—

HARD WOODS.

Ash, Quebec	per load	3 17 6	7 5 0
Birch, New Brunswick	do.	2 5 0	4 17 6
Do. Quebec do.	do.	2 10 0	5 10 0
Box, Turkey	per ton	7 0 0	20 0 0
Cedar, Cuba	per ft. sup.	0 0 3 ¹	0 0 3 ¹
Do. Honduras	do.	0 0 3 ¹	—
Do. Tobacco	do.	0 0 5 ¹	—
Elm, Quebec	per load	4 0 0	8 10 0
Jarrah, planks	per ft. cu.	0 2 6	0 3 0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0 0 3 ¹	—
Do. Tobacco	do.	0 0 5 ¹	—
Do. Cuba	do.	0 0 2 ¹	—
Do. African	do.	0 0 3 ¹	—
Oak, Wainscot	per log.	3 0 0	6 15 0
Teak, Indian, logs	per load	10 0 0	19 0 0
Do. do. planks	do.	13 0 0	20 10 0
Whitewood, American, logs	per ft. cu.	0 1 3	0 1 6
Do. do. planks and boards	do.	0 1 3	0 3 0

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending July 28th thirty failures in the building and timber trades in England and Wales were gazetted.

M. T. RODWELL, plumber, Leicester. Adj. July 22nd.

T. V. PULLAN, plumber, Harrogate. P.E., Courts of Justice, York, Aug. 4th, at 11.

H. E. CARTER, surveyor, Basinghall Street, London. Liabilities £18,655; £5,414 expected to rank; assets nil.

G. DANSON, builder, Barton-on-Humber. R.O. July 21st.

J. FRIEDENTHAL, wallpaper merchant, Hull. P.E., Hull C.C., Aug. 21st, at 2.

T. HEWSON, foreman bricklayer (late builder), Hull. P.E., Hull C.C., Aug. 21st, at 2.

C. J. AGER, surveyor, 48, London Wall. Liabilities £652; assets nil.

B. NIGHTINGALE, builder, &c., New Cleethorpes. First meeting, O.R.'s, Great Grimsby, Aug. 2nd, at 12.

P.E., Great Grimsby Town Hall, Aug. 3rd, at 11.

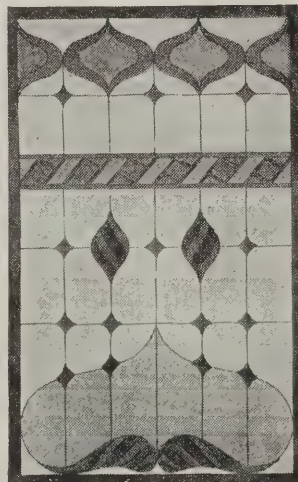
G. J. KELLEY, builder, Knowle, Bristol. First meeting, O.R.'s, Bristol, Aug. 2nd, at 12. P.E., Guildhall, Bristol, Sept. 29th, at 12.

METCALFE BROTHERS, builders and contractors, Bradford. First meeting, O.R.'s, Bradford, Aug. 9th, at 3.

P.E. Bradford C.C., Aug. 23rd, at 10.

G. H. WRAY, builder and contractor, Harrogate. First meeting, O.R.'s, York, Aug. 5th, at 11.30. P.E., Courts of Justice, York, October 6th, at 11.

"CLOISONNE GLASS"



A decorative material transparent and opaque.

Production 1904—17,000 square feet.

The CLOISONNE GLASS CO.

9^E Berners St., Oxford St., London, W.

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Sole Manufacturers.

THE ANAGLYPTA BRANCH

of the Wall Paper Manufacturers Limited.

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VIEW OF A PORTION OF THE RECENTLY OPENED SHOWROOMS.

2 & 3, NORFOLK STREET,
STRAND, LONDON.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Beverley.—For the erection of an infant school for 250 scholars in Walkergate, for the Education Committee. Messrs. Hawe & Foley, architects, North Bar Street, Beverley:—

Calvert & Sons	£3,690	0	0
J. R. Foley	3,550	0	0
R. Pope	3,345	19	4
G. P. Watson	3,323	0	0
F. Sweeting	3,295	0	0
J. Constable,* Beverley	3,006	0	0

* Accepted.

Byfield (Northampton).—For the erection of a new Council school, for the Education Committee. Messrs. Law & Harris, architects, 1, Sheep Street, Northampton:—

J. F. Booth, Banbury	£2,825		
J. Guttridge, Peterborough	2,690		
T. Kinch, Eydun, Byfield	2,661		
C. Wright, Leicester	2,650		
G. Henson & Son, Wellingborough	2,595		
S. Hipwell & Co., Wisbech	2,500		
H. Martin	2,484		
Hackley Brothers, Wellingborough	2,429		
W. Heap	2,422		
F. G. Watson, Rugby	2,420		
E. Archer	2,379		
G. W. Souster	2,353		
A. J. Chown	2,350		
Co-operative Builders, Kettering	2,335		
C. Fisher	2,287		
T. Higgs*	2,280		

* Accepted provisionally. [Rest of Northampton.]

Cardiff.—For the erection of a new mission-hall with vestries and classrooms, for the Rev. John Pugh, D.D. Messrs. Veall & Sant, architects, Cardiff:—

Ransom	£4,711	5	4
F. Bond	4,170	0	0
J. E. Evans	3,930	0	0
J. Allan & Son	3,900	0	0
D. Davies	3,886	0	0
G. Hallett	3,820	0	0
Melhuish Brothers	3,758	13	0
W. Symonds & Co.	3,761	19	0
E. R. Evans & Brothers	3,645	0	0
W. T. Morgan	3,500	0	0
T. Bevan, Penarth	3,485	7	0
Knox & Wells*	3,443	0	0

* Accepted. [Rest of Cardiff.]

Douglas (Cork).—Accepted for the erection of a residence. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork:—

F. Dolan, Queenstown	£1,190		
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Dundalk.—For the erection of a gymnasium, lavatories, bathrooms and general structural and drainage alterations to the Educational Institution, for the Incorporated Society. Mr. W. S. Barber, architect, Francis Street, Dundalk:—

J. Pemberton, Dublin	£1,801	0	0
McKee & McNally, Dungannon	1,582	10	0
J. McAdorey, Dundalk	1,505	0	0
T. McDonald, Dundalk	1,458	0	0
J. Kennedy, Dublin	1,501	19	0
S. Parks & Son,* Dundalk	1,426	2	0

* Accepted.

Kirkcaldy.—Accepted for the erection of an elementary school to accommodate 1,000 children, for the School Board (exclusive of furniture, painting and electric light). Mr. D. Forbes Smith, architect, Kirkcaldy. Quantities by the architect:—

Mason—Balfour Brothers, Sinclair-town	£3,598	0	0
Joiner—Bogie & Nicoll	1,894	0	0
Plumber—J. Wood & Son	466	18	11
Plasterer—W. & J. Easton	366	0	0
Slater—Currie & Cant	264	0	0
Heating and ventilating engineer—Mackenzie & Moncur, Edinburgh	582	10	0
Stoneworker—Thomson Brothers	397	14	5
Glazier—Cunningham & Co., Edinburgh	53	12	0

[Rest of Kirkcaldy.]

Leytonstone.—For alterations and additions to the board-room and offices at the workhouse, for the Guardians of West Ham Union. Mr. J. Williams Dunford, architect, rooc, Queen Victoria Street, E.C.:—

Shurmut & Sons, Clapton	£7,821	676	
Newell & Lusty, Poplar	7,400	550	
J. & W. Inkpen, City Road, E.C.	7,150	540	
H. C. Horswill, Forest Gate	6,967	510	
Gregar & Son, Stratford	6,333	626	
Fuller & Sons, Walthamstow	5,935	604	
Sands & Burley, Walthamstow	5,598	479	
W. Maddison, Canning Town	5,821	560	
F. J. Coxhead, Leytonstone	5,293	540	

[Rest of Leytonstone.]

London, W.C.—For the erection of the Patents Office extension, Fumival Street, for the Commissioners of H.M. Works and Public Buildings:—

Yorkshire stone	"Shamrock" stone		
H. Willcock & Co.	£26,500	0	0
F. J. Stanbury	22,164	10	7
E. P. Bulled & Co.	22,064	0	0

* Accepted. A.—Alternative work.

Perry & Co.	£21,089	0	0
Leslie & Co.	21,069	0	0
H. Lovatt, Ltd.	21,870	0	0
H. L. Holloway	21,527	0	0
J. Mowlem & Co.	21,477	0	0
Martin, Wells & Co.	21,159	0	0
J. Allen & Sons	21,150	0	0
J. Christie	21,000	0	0
G. Godson & Sons	20,921	0	0
Turtle & Appleton	20,906	0	0
G. E. Wallis & Sons	20,884	0	0
Waring-White Building Co.	20,800	0	0
W. Smith & Sons	20,765	0	0
J. & M. Patrick	20,707	0	0
F. & H. F. Higgs	20,700	0	0
J. Garrett & Sons	20,684	0	0
F. Gough & Co.	20,634	0	0
Perry Brothers	20,361	0	0
T. H. Kingierlee & Sons	20,353	0	0
Patman & Fotheringham	20,323	0	0
E. Laurance & Sons	20,190	0	0
Higgs & Hill	20,164	0	0
W. H. Lorden & Son	20,000	0	0
J. Chessum & Sons	19,987	0	0
W. Downs	19,987	0	0
H. J. Williams, Ltd.	19,927	0	0
C. Wall, Ltd.	19,700	0	0
B. E. Nightingale	19,490	0	0
J. Smith & Sons*	19,474	0	0

* Accepted.

Middlesbrough.—For the erection of the Crescent Road Schools, for the Education Committee. Messrs. R. Lothhouse & Son, architects, 62, Albert Road, Middlesbrough:—

B. Crisp & Son	£19,430	1	2
H. McNaughton	16,905	3	3
T. Dickenson & Son	16,066	0	0
W. C. Atkinson & Son	16,495	3	11
H. Doughty & Son	16,439	5	0
S. Coates	16,344	13	5
Hudson Brothers	16,310	0	0
Bastiman Brothers	16,211	13	5
Vinter & Davidson	15,808	0	0
J. Daveson	15,800	0	0
J. G. Porteous	15,786	0	0
J. Howe & Co.	15,650	1	7
C. Moss	15,562	17	6
T. Brown	15,500	0	0
Allison Brothers	15,440	0	0
Thompson Brothers	15,287	5	0
Watt Brothers	15,190	0	0
G. Radge	15,172	0	0
J. Proud	14,695	9	8
W. Pearson	14,621	14	8

Maesycwmmr.—For the erection of two houses, for Mr. Thomas Price. Mr. W. A. Griffiths, architect and surveyor, Pontlanfraith, Mon.:—

Jenkins & Davies, Maesycwmmr, Cardiff	£720	0	0
M. Gibbon & Son, Ystrad Mynach	556	16	0
J. Lloyd,* Ystrad Mynach, via Cardiff	450	0	0

* Accepted.

Sudbury (Suffolk).—For new sanitary annexes and drainage at the workhouse, for the Board of Guardians. Messrs. Clare & Ross, M.S.A., architects, 1, West Street, Finsbury Circus, London, E.C.:—

G. C. Gooday, Sudbury	£3,493	17	5
W. Bell & Sons, Cambridge	3,320	0	0
Oak Building Co., Cambridge	3,100	0	0
Cubitt & Gots, Ipswich	2,940	0	0
Goulson & Loftis, Cambridge	2,900	0	0
Redding & Son, Cambridge	2,890	0	0
G. Grimwood & Sons, Sudbury	2,848	0	0
H. J. Linzell, Newmarket	2,833	0	0
Scales & Robins, Cambridge	2,775	0	0
Mason & Son, Haverhill	2,749	0	0
W. Manders, Leyton	2,726	19	4
Brown & Graham, Cavendish, & Portway & Co., Sudbury	2,715	2	8
A. Suckling & Co.,* Halstead	2,675	0	0

* Accepted.

Twickenham.—For the erection of Trafalgar Schools, Third Cross Road, for the Urban District Council. Mr. H. A. Cheers, architect, 35, Waldegrave Park, Twickenham. Quantities by Mr. W. Herring, 163, Strand, W.C.:—

W. H. Hyde	£16,960		
Stimson & Co.	16,700		
J. Ferguson & Co.	16,400		
Ennes Brothers	16,088		
J. W. Brooking	15,990		
W. R. Williams	15,950		
Myall & Upson	15,874		
J. Barker & Co.	15,830		
E. Wall	15,750		
G. Parker	15,550		
H. Willcox & Co.	15,484		
J. Chessum & Sons	15,400		
Speechley & Smith	15,315		
Oak Building Co.	15,306		
J. Appleby & Sons	15,300		
Martin, Wells & Co.	15,240		
B. E. Nightingale	15,181		
W. J. Fryer & Co.	15,044		
Cropley Brothers	14,995		
Spencer, Santo & Co.	14,940		
D. W. Barker	14,897		
S. N. Scole & Son	14,857		
Wisdom Brothers	14,750		
W. Moss & Son	14,742		
C. Wall, Ltd.	14,666		
W. Lawrence & Son	14,484		
A. Hudson	14,450		
W. H. Lorden & Son	14,444		
W. Wallis	14,228		
Turtle & Appleton	14,220		
H. Flint	14,177		
G. H. Gibson	14,095		
W. J. Dickens	13,997		
W. J. Renshaw	13,993		
Cowley & Drake	13,641		
J. & M. Patrick,* Wandsworth	13,399		

* Accepted.

(Continued on p. xxiii.)

ROOFING SLATES:

Velinheli, Penrhyn, and Westmoreland.

SLATE SLAB GOODS:

Both Plain and Enamelled.

ALFRED CARTER & CO., LIVERPOOL.

KINGSLEY JOINERY WORKS,

Grange Road, Willesden Green, N.W.

HIGH CLASS JOINERY and MOULDINGS of every description.

CALLOW & WRIGHT,

Office: Brondesbury Park. Willesden Green.

LIGHT & DARK SEA GREEN STONE, MOTTLED GREEN STONE,

For Mullions, Sills, Heads, Quoins, Jambs, Fenders, &c.

Buttermere Green Slate and Stone Works, KESWICK.

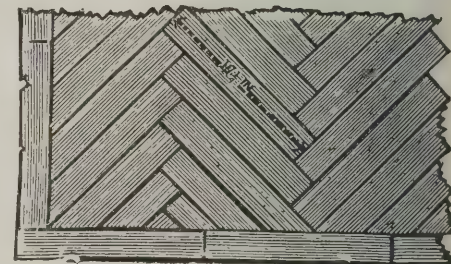
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ESTABLISHED 1851.

Current Accounts. 2% Interest allowed on minimum monthly balances when not drawn below £100. Deposits. 2½% Interest allowed on Deposit Accounts. Advances made. Stocks and Shares bought and sold.

Apply Secretary, Southampton Buildings, High Holborn, W.C.

FLOORING BLOCKS



Per 100 Blocks out of sizes.	YELLOW.		PITCHPINE	
	At Wharf.	ex Ship within one Month.	At Wharf.	
17½ × 3 × 3	12 9	12 0	16 6	
17½ × 3 × 2	8 3	7 9	11 5	
17½ × 3 × 1½	6 9	6 3	9 0	



PRIME DRY OAK & PITCH PINE FLOORINGS

With Special Joint to conceal Nails—

1½ × 4 Oak, 56/9 Pitch Pine 27/- per square.

1 × 4 " 45/- " 22/9 "

These prices do not include desiccation.

VIGERS BROTHERS, TIMBER MERCHANTS,

Only Address—67, KING WILLIAM STREET, E.C. Telephone Nos. 601 and 602 Avenue.

TENDERS—cont. from p. xxii.

Barking.—For the erection of Baptist Tabernacle.										Less if one month longer were allowed.
Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	
A.	B.	C.	D.	E.	F.	G.	H.	I.		
Higgs & Hill	£2,140	£28 0 0	£23 0 0	£344	£284 0 0	£148	£19	£40 0 0	£32 0 0	£30
Halliday & Greenwood	1,672	16 0 0	16 15 0	270	237 0 0	133	20	31 0 0	26 0 0	Nil.
C. North	1,656	24 10 0	40 0 0	271	230 0 0	142	17	40 0 0	30 0 0	£50
Battley, Sons & Holness	1,587	15 0 0	10 0 0	247	215 0 0	132	18	34 0 0	29 0 0	Nil.
Sands & Burley*	1,400	13 5 0	15 4 0	241	241 6 0	139	18	23 7 0	30 8 0	£10

* Accepted with modifications.

Tendring (Essex).—For heating the workhouse and infirmary, for the Guardians. Messrs. Price & Belsham, architects, 52, Queen Victoria Street, E.C. :—

W. J. Burroughs & Sons	£2,979 17 0
J. E. Tabor	2,200 0 0
B. Parker, Ltd.	2,037 0 0
J. Richmond & Co.	1,925 0 0
Dargue, Griffiths & Co.	1,766 0 0
Z. D. Berry & Sons	1,750 0 0
Cocksedge & Co.	1,720 0 0
M. Duffield & Sons	1,700 0 0
Strode & Co.	1,697 0 0
F. W. Lewellin & Co.	1,675 0 0
Ditto	1,625 0 0
Stanford & Co.	1,628 15 0
Ditto	1,598 15 0
J. & F. May	1,595 0 0
G. H. Robinson	1,590 0 0
R. Clarke	1,569 0 0
R. Dawson & Co.	1,549 0 0
Brightside Foundry & Engineering Co.	1,530 0 0
A. J. Harvey	1,528 0 0
Lancashire Heating Co.	1,507 0 0
Ditto	1,483 0 0
Hefford & Shuttlewood,* Leicester	1,497 10 0

* Accepted.

Ventnor (I.W.).—Accepted for the erection of new schools, for the Education Committee :—

J. Sims, Ventnor	£3,900
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Coming Events.

Wednesday, August 2.

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.—Meeting at 8 p.m.

Saturday, August 5.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Annual General Meeting at Newcastle, at 2 p.m.

A Large Dam across the River Leven, or Rannock Moor, in Argyleshire, is to be built to create a lake 7 miles long at an elevation of over 1,000ft. The works will be carried out for the Loch Leven Water and Electric Power Co. by Sir John Jackson, Ltd., and the expenditure is estimated to be little short of half a million sterling. The power created will be used by the British Aluminium Co., Ltd., for the production of aluminium.

The Extension of Bradford Town Hall is being carried out from plans by Mr. F. E. P. Edwards, the city architect, who has had the advice of Mr. Norman Shaw, R.A. The general plan consists of a hollow block of buildings, enclosed in a large internal area, which is subdivided by a central block containing the council-chamber. The alterations which will subsequently be made to the present building will principally consist of a re-planning of the main entrance hall and internal staircase, which it is proposed to reconstruct 12ft. wide, leading in three flights to the central corridor communicating with the principal room. The contracts already provide for the whole of the work up to the level of the ground floor, and amount to £10,969, but the total cost of the extension is estimated at £70,000.

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THOMAS ROPER & SONS, LTD., contractors, builders, &c., Bruce Works, Sheffield. Capital: £11,000.

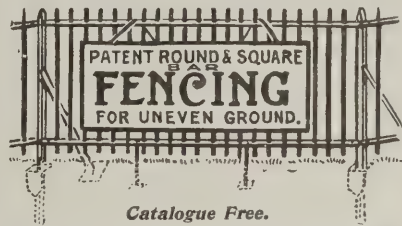
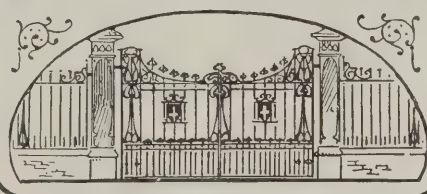
CHARLES COTON & CO., LTD., builders, decorators, &c., Bexley, Kent. Capital: £3,000.

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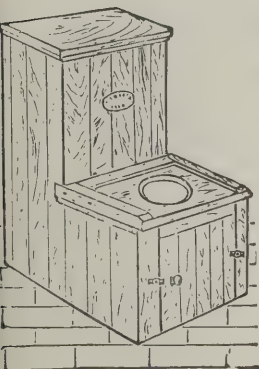
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MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 10.
August, 1905.

COMPARATIVE COMBUSTIBILITY OF TIMBERS.

By G. R. CHERRY, Sydney, N.S.W.

IN these latter days, when in every quarter of the world are eager scientific workers ever on the outlook for an unoccupied field in which to pursue their researches, it can only be by rare good fortune that a humble outsider should stumble by a happy chance upon a territory hitherto unexplored. It would seem, however, that this is actually what has happened with regard to the singularly important matter which forms the subject of my present article.

The nearest approach to anything of the kind that I have been able to discover were the interesting experiments conducted in 1902 by Prof. Ira H. Woolson, of Columbia University, New York, and Prof. Charles L. Norton, of the Massachusetts Institute of Technology, in testing the fire-resisting qualities of so-called "fireproof" wood, and which are recorded in "Insurance Engineering" of that year. I am indebted to Professor Woolson for his idea of recording the duration of the flame and glow after the conclusion of the test.

By availing ourselves of the published works of the various scientific men who have devoted themselves to the study of our Australian timbers we are able to acquire very much valuable information regarding them. To the student desirous of ascertaining the economic value of this great national asset—the enormous importance whereof will possibly not be realized by us until too late—those works which would be of the greatest use are "Australian Timbers," by Prof. W. H. Warren, of the Sydney University, and "Research on the Eucalypts," by Messrs. R. T. Baker and H. G. Smith, of the Technological Museum, Sydney. The former work deals with the subject from the viewpoint of the engineer, and gives the transverse, tensile, bearing and compressive resistances of all the most valuable timbers; whilst the latter is the result of the collaboration of a botanist and a chemist, and gives the exact chemical constituents of the various trees based on a scientifically accurate determination of each variety dealt with.

It would be a quite unwarranted presumption for me to range myself by the side of these distinguished men, but I confess to cherishing the hope that my work may—*ingo intervallo*—be regarded in some measure as a continuation of theirs, as being another contribution to our store of knowledge concerning the specific value of our native timbers.

It is sometimes interesting to trace the genesis and growth of an idea. Some five years ago Mr. Charles Hedley told me that the wood of the *Syncarpia laurifolia*, or

turpentine tree, was distasteful to the "termite," or "white ant." As I had been just looking at the fibrous mass which represented a portion, one of the massive ironbark girders, taken from the building of the Australian Museum after having been operated upon by the aforesaid termite, this seemed to me to be a very important fact. I already knew that this timber was difficult to burn, and that in salt water, used as piles, it resisted the attack of the ship-worm. I accordingly thought that there must be some very vital reason for the preference shown by local builders for ironbark, and concluded that it must be some defect in the direction of its strength. On looking the matter up in Professor Warren's "Australian Timbers" I found that, compared with the very best ironbark (*Eucalyptus crebra*), the difference was only one of degree, the figures given for turpentine wood being very good indeed.

I then thought I should like to ascertain the relative inflammability of ironbark and turpentine wood, and in order to do this I had to design the machine which is here illustrated. Having gone thus far, I concluded that it would be just as well to extend the comparison so as to include the principal Australian timbers and also as many as I could get of the commercial timbers from other countries available here. I should not have been able to do this had I not been so fortunate as to enlist the enthusiastic co-operation of Mr. R. T. Baker, the Curator of the Technological Museum, who met my appeal for assistance in the spirit of the true scientist. He at once offered to help me to the fullest extent of his power, and he has furnished me with specimens of nearly all the timbers dealt with in my paper—each of these specimens being exactly the same size, and planed up so beautifully that I felt loth to burn it, and that each was furnished with its true scientific and local name. The value of his collaboration was enormous.

The Testing Machine.

The testing machine, or "xylopyre" (*xylon*, wood, and *pyrōo*, to test by fire) consists of four steel rods 15 ins. long, rising from each corner of a steel base 6 ins. square. These rods converge together at the top, where they embrace the upper end of a brass tube 6 ins. long, the lower end of the said tube being braced to the rods. At a distance of 5½ ins. from the base the rods are connected by a platform made of stout wire, and upon this platform, which is 4 ins. across, rests the little log of wood (6 ins. by ½ in. by ½ in.) which is to be tested. Across the centre of this log is placed the chisel-shaped end of a steel spindle, which travels vertically in the brass-guiding tube, the top of the spindle being weighted. A spiral brass spring is fixed to the top of the machine so as to relieve it from the jar of the weighted spindle when the test is completed. A gas-burner is so

arranged that a "rat tail" flame 1½ ins. long impinges on the lower surface of the wood. This is so regulated that the conditions of test shall be identical in every case. The weighted spindle weighs 448.84 grammes (15.71 ozs. avoirdupois). The test begins when the log is placed in position over the gas jet, and ends when the spindle falls. The time is taken by a stop-watch measuring fifths of seconds. I submitted the machine to Professor Warren before doing any work with it, and he honoured it with his approval and considered that it should do what I required of it. It has done its work in a manner that reflects credit upon its maker, Mr. Robert Boxall.

Explanation of Tabulated List.

The timbers are arranged in the order of their fire resistance. The number in the first column is that of the specimen. Then follow the scientific and local names of the timbers, the column headed "Test" giving the time in minutes and seconds of the endurance; that headed "Flame" giving the time during which the flame (if any) endured after the conclusion of the test; and that headed "Glow" showing the duration of the glow (if any) after the flame had expired. The weight of each test log is given in grammes and ounces avoirdupois so as to facilitate reference by users of the metric or British systems.

Test Logs.

The test logs measure 6 ins. long by ½ in. square (15.24 centimetres long by 12.70 millimetres square). It will therefore take ninety-six of these little logs to make a plank 1 ft. square by 1 in. thick; twelve of these planks taken together equal a cubic foot. If, therefore, we take the weight shown in the table for a test log in ounces avoirdupois, multiply this by 96, and divide the result by 16, we should get the weight in lbs. of a square foot of the timber 1 in. thick, and by multiplying this again by 12 we get the weight in lbs. of a cubic foot.

A cursory glance at the tabulated list will show that the great majority of our native timbers offer a better resistance to fire than the foreign timbers tested. The very low comparative resistance offered by Rangoon teak and English oak is rather instructive. From amongst our native timbers, however, there are two that stand head and shoulders above the rest. They are *Eucalyptus Fletcheri* and *Syncarpia laurifolia*, and I shall chiefly confine my remarks to these.

Eucalyptus Fletcheri (R. T. Baker), "Lignum Vitæ" or "Box." (Test 19 min. 17 sec.). This is a medium-sized tree. The timber is pale-coloured, but brown towards the centre, and is very hard, tough and durable. No practical use can apparently be made of this timber, and it is now comparatively rare, or, at least, its geographical distribution is not well known. So far as is at present known, its natural habitat is

restricted to the watershed of the Nepean river, and owing to its good qualities it has been extensively cut by timber-getters; so that, with the exception of some few specimens which still remain at Thirlmere, it is almost extinct. It is to be hoped that Germany has already supplied herself with some of the seed, so that in time to come, when the value of this timber is appreciated by us, we may be able to secure an occasional shipment from the other side of the world. It is almost too much to expect that our local authorities will take any steps towards perpetuating this species before it is too late. In the meantime, however, we can only record the fact of the remarkable fire-resisting properties possessed by this timber, and regret that our builders are at present unable to avail themselves of it.

Syncarpia laurifolia (Tenore), "Turpentine Tree." (Test 12 min. 58 sec.) From 120ft. to 180ft. is not an unusual height for this tree, and it often measures 20ft. to 30ft. in circumference, with great length of bole. It grows throughout the coast districts of New South Wales, extending into Queensland on the north, its southern limit being the head of Cockwhy Creek, between Ulladulla and Bateman's Bay. It is common in the following countries of New South Wales, viz., Camden, Cook, Cumberland, Dudley, Raleigh, Durham, Fitzroy, Gloucester, Hunter, Macquarie, Northumberland, Rous, St. Vincent and Westmoreland, and covers an area totalling 540,337 acres.

Mr. J. H. Maiden, Government botanist, and Mr. J. V. de Cocque, timber expert, Public Works Department, in a report made by them in 1895 give the following characteristics of the timber: "Turpentine is, for a hardwood, soft when green but hard when dry. It is of a sandy or gritty nature, rapidly dulling the saws, hence sawmillers do not like it. It splits and shrinks badly in sawn sizes free from bark, unless some attention is given to seasoning it. It is very durable when placed in the ground, and a great recommendation for many purposes is the difficulty of burning it."

Mr. Maiden, in the "Agricultural Gazette," 1894, says: "In a certain suburb some carters did a roaring trade in 'ironbark' firewood, at a rate very much below that ruling for ironbark. When the wood began to be used complaints were very general, for it would burn with difficulty. I found that the wood was turpentine and that the enterprising carters had been clearing a turpentine paddock about two miles away." He also says, in "Forest Flora of New South Wales": "It is not easy to burn except with a good draught. In such situations as pillars, girders, &c., in buildings it usually only chars, and is in consequence easily extinguished." He relates an instance of a case where in a large fire in Sydney the girders and joists, which were of turpentine, were put to a very severe test without giving way, and thus saved the building from being gutted. He also states that the timber is very resistant to white ant.

Mr. de Cocque, in "Journal of Royal Society," 1894, says: "I have yet to see any hardwood these pests (white ants) will pass by if pushed for sustenance, except perhaps true turpentine. This timber, which grows in abundance between Gosford and Teralba, bears a splendid record for durability, and does not warp or twist like that from northern rivers."

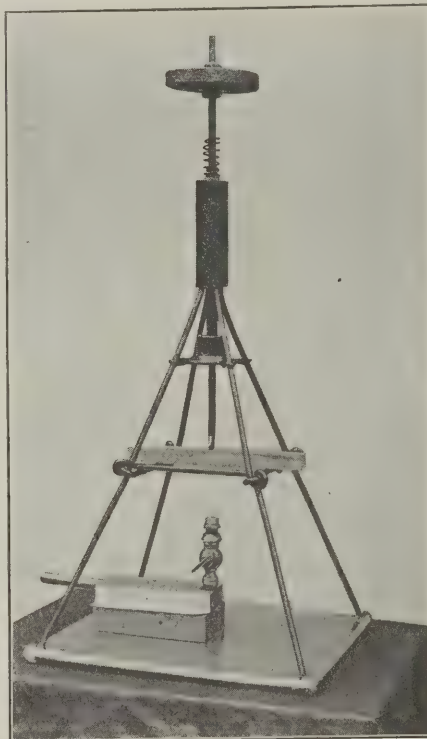
To architects I would particularly recommend this timber, especially from the district mentioned above. It should never be used in sawn sizes unless cut from fully-grown trees. It is easily worked, but is extremely short in grain; consequently it will not bear much breaking strain, but in all other parts of a building I can speak of it in terms of praise. A feature of turpentine is that white ants rarely ever touch it, green or dry. Another strong recommendation is that it will not burn; it chars, but will not ignite.

If you put a turpentine log on a fire the chances are that it will go out.

Mr. Augustus Ruddet, in "Agricultural Gazette," 1896, says: "The timber of this tree is fairly lasting, but is apt to rend and warp a good deal in sawn stuff in the seasoning, but this, so I am informed, is entirely obviated by a few weeks' soakage in water, and I have seen it after this treatment free from cracks."

It is interesting to note that this tree is very nearly related to the New Zealand "Rata," which has in common with the turpentine, the valuable properties of durability and resistance to teredo. Unlike the turpentine, however, the rata makes excellent firewood, although difficult to split. Turpentine wood is usually dull red in colour, but varies from that to brown or purple brown, and has a good grain.

For purposes of comparison I have extracted the following figures from Professor Warren's "Australian Timbers," being the



LABORATORY TESTING EQUIPMENT USED FOR INVESTIGATING THE RELATIVE COMBUSTIBILITY OF WOOD.

average results given by the best seasoned specimens:—

	Iron- bark.	Turpen- tine.
Transverse strength:		
Modulus of rupture in lbs. per sq. in. - - -	20,452	16,591
Compressive strength:		
Breaking load in lbs. per sq. in.—		
12ins. by 3ins. by 3ins. (4 to 1) - - -	12,307	9,885
24ins. by 3ins. by 3ins. (8 to 1) - - -	11,048	9,139
48ins. by 3ins. by 3ins. (16 to 1) - - -	10,666	8,595
72ins. by 3ins. by 3ins. (24 to 1) - - -	8,538	5,580
Tensile strength:		
Breaking load in lbs. per sq. in. - - -	21,845	19,003
Shearing strength:		
Breaking load in lbs. per sq. in. - - -	2,160	1,775

According to Professor Warren, "the transverse strength of ironbark timber is half that of good cast-iron, the tensile strength half that of good wrought-iron, and for strength, elasticity and durability combined it is unrivalled." Ironbark, however, is very

much appreciated by white ant, and in point of resistance to fire the better known ironbarks (such as *E. paniculata* and *E. crebra*) rank below many others of our native timbers, although in this respect when compared with European, American or New Zealand timbers they are greatly superior. The best ironbark is yearly becoming more difficult to obtain owing to the great demand for it.

In the timber of the *Syncarpia laurifolia* we have one that is specially non-combustible; it is distasteful to white ant, and in point of strength gives results not badly behind those recorded for ironbark. It is, moreover, obtainable in any size and at a cheap rate, and the supply will take many years to exhaust. All of these factors are of importance in assessing the value of a timber as regards its use in building construction, and when we find all these factors in combination some very potent reason indeed must be brought forward to explain how it comes about that we scarcely ever hear of turpentine being used otherwise than as piles for wharf building.

Architects and builders will probably say that it does not season well; but inasmuch as it has been shown that it can be seasoned in such a manner that the result is a beautiful rich-coloured timber, free from shakes and flaws, the fact that it is not properly dealt with seems to point rather to lack of care or knowledge on the part of the timber merchant, and should not be laid to the debit of the timber itself. It may be also alleged that when built into a structure whilst green it is given to warping. But this is a trouble that is common to a greater or less extent with all our valuable hardwoods, and the remedy seems to be for architects to specify that none but properly seasoned timber shall be employed. These, however, are technical matters which can be much better handled by the professional architect and builder. I have now made out my case for the turpentine, and will let the matter go to judgment.

I am very glad to have at last dealt with this matter, which has often occupied my thoughts during the past five years and has filled up all my spare time during two months. To the scientific man, properly equipped both mentally and physically, knowing exactly how the research should be conducted, and provided with an up-to-date laboratory in which to work, these results may appear rather meagre. I have, however, done the best I could with crude and unscientific appliances to ensure correct results, and perhaps some of our American or British "fellow-labourers in the vineyard" may take up the idea and with the aid of their splendidly-equipped laboratories carry it to a correct and scientific conclusion. I have not by any means exhausted the field. My specimens comprise most of the Australian commercial timbers, but only a very few from other countries, and in each of those countries a similar research into the relative combustibility of the local timbers would be of great value to the local underwriter.

In order to facilitate such research I have fully described the machine and method of testing which I have adopted, so that the conditions may be reproduced without much difficulty. Specimens should be taken from the best part of the timber, and not from those portions which are rejected commercially, such as sap or heart-wood, as the case may be. The timber must also be perfectly seasoned. In order to obtain a standard of comparison I would suggest that in the event of an American taking up the idea, he should procure a number of test logs (6ins. by 3ins.) of Californian redwood, for instance, and keep on burning them until he gets the same result as myself. He could then feel pretty certain that his machine was properly adjusted. An Englishman could in the same way make use of oak, teak or Baltic red deal for this purpose.

COMPARATIVE COMBUSTIBILITY OF TIMBERS. G. RODNEY CHERRY.

No. of Specimen.	Name.	Author.	Local Name.	Test.		Flame.		Glow.		Weight of Specimen.	
				M.	S.	M.	S.	M.	S.	Grams.	Oz. Avoir.
42	Eucalyptus Fletcheri ...	R. T. B.	Box ...	19	17	...	...	...	...	30'21	1'05
39	Syncarpia laurifolia ...	Ten.	Turpentine ...	12	58	...	40	...	...	28'85	1'00
46	Casuarina torulosa ...	Ait.	Forest Oak ...	8	55	...	...	...	5	32'01	1'12
2	do. Luehmanni ...	R. T. B.	Bull Oak ...	7	53	...	...	...	...	31'33	1'09
40	Eucalyptus ovalifolia var. lanceolata.	R. T. B., H. G. S.	Red Box ...	7	44	I	5	...	...	30'20	1'05
5	Casuarina Cambagei ...	R. T. B.	Belah ...	7	34	...	...	34	...	33'02	1'15
43	Eucalyptus acmenoides ...	Schau.	White Mahogany ...	7	28	I	15	...	...	25'93	'90
35	do. dealbata ...	A. Cunn.	Cabbage Gum ...	7	19	...	59	...	...	26'19	'91
18	do. eugenoides ...	F. v. M.	White Stringybark ...	7	11	I	16	...	...	25'24	'88
38	do. Bridgesiana ...	R. T. B.	Woollybutt ...	7	11	2	9	...	...	29'56	1'03
3	do. punctata ...	D. C.	Grey Gum ...	7	6	...	...	...	...	28'48	'99
60	do. tetricornis var. linearis.	R. T. B., H. G. S.	River Gum ...	7	6	...	...	25	...	23'58	'82
44	do. Planchoniana ...	F. v. M.	Stringybark ...	7	4	I	16	...	...	26'45	'92
25	do. ovalifolia ...	R. T. B.	Red Box ...	6	56	...	...	...	...	29'97	1'04
55	do. maculosa ...	R. T. B.	Spotted Gum ...	6	48	I	11	...	...	17'63	'61
92	do. microtheca ...	F. v. M.	Swamp Box ...	6	45	I	25	...	...	26'14	'91
1	do. melanophloia ...	F. v. M.	Silver-leaf Ironbark ...	6	42	I	...	...	...	29'85	1'04
61	do. Maidenii ...	F. v. M.	Blue Gum ...	6	35	I	36	...	...	25'51	'89
67	do. longifolia ...	Link and Otto	Peppermint or Woollybutt ...	6	35	...	45	...	...	27'39	'95
81	do. macrohynchia ...	F. v. M.	Red Stringybark ...	6	34	...	54	...	...	22'97	'80
52	do. Wilkinsoniana ...	R. T. B.	Small-leaf Stringybark ...	6	24	I	21	...	...	21'82	'76
8	do. quadrangulata ...	H. D., J. H. M.	Grey Box ...	6	16	2	25	...	...	27'69	'96
34	do. Woolsiana ...	R. T. B.	Mallee Box ...	6	11	I	44	...	...	31'51	1'10
29	do. tetricornis ...	Sm.	Red Gum ...	6	10	...	20	...	...	29'65	1'03
31	do. oleosa ...	F. v. M.	Red or Water Mallee ...	6	9	...	50	...	...	31'47	1'10
45	do. cinerea ...	F. v. M.	Argyle Apple ...	6	9	I	26	...	...	30'28	1'05
66	do. squamosa ...	H. D., J. H. M.	Ironwood ...	6	7	...	35	...	...	26'85	'93
53	do. intertexta ...	R. T. B.	Spotted Gum ...	6	5	...	55	...	...	28'67	1'00
19	do. resinifera ...	Sm.	Mahogany ...	5	55	...	48	...	...	27'22	'95
82	do. capitellata ...	Sm.	Brown Stringybark ...	5	55	2	34	...	...	20'38	'71
9	do. microcorys ...	F. v. M.	Tallow-wood ...	5	53	I	30	...	...	27'59	'95
11	do. paniculata ...	Sm.	White Ironbark ...	5	49	...	47	20	...	33'53	1'17
14	do. Dawsoni ...	R. T. B.	Slaty Gum ...	5	47	...	55	...	...	31'12	1'08
59	do. bicolor ...	A. Cunn.	Bastard Box ...	5	47	I	11	35	...	26'57	'92
24	do. Smithii ...	R. T. B.	Gully Ash ...	5	42	...	55	...	...	28'68	1'00
102	do. marginata ...	Sm.	Jarrah (W. A.) ...	5	42	...	44	...	...	18'27	'63
117	do. siderophloia ...	Benth.	Broad-leaf Ironbark ...	5	39	I	14	2	...	29'40	1'02
51	do. laevopinea ...	R. T. B.	Silver-top Stringybark ...	5	34	I	53	...	...	22'46	'78
7	do. saligna ...	Sm.	Sydney Blue Gum ...	5	31	...	45	...	...	27'15	'95
28	do. pendula ...	A. Cunn.	Red Box ...	5	30	...	30	...	...	29'96	1'04
15	do. dextropinea ...	R. T. B.	Stringybark ...	5	29	...	50	...	...	19'89	'69
12	do. sideroxylon ...	A. Cunn.	Red Ironbark ...	5	25	...	...	...	...	25'72	'90
54	do. nigra ...	R. T. B.	Black Stringybark ...	5	21	I	30	...	...	22'73	'79
64	do. Bosistoana ...	Miq.	Box ...	5	19	I	10	...	...	24'94	'87
68	do. dives ...	Schau.	Peppermint ...	5	19	I	8	...	...	16'70	'58
50	do. Morrissii ...	R. T. B.	Grey Mallee ...	5	17	I	52	...	...	26'52	'92
93	do. albens ...	Miq.	White Box ...	5	17	2	12	...	...	28'31	'99
94	do. hemiphloia ...	F. v. M.	Box ...	5	16	I	31	...	...	27'95	'97
17	do. rostrata ...	Schl.	Red Gum ...	5	15	...	49	...	...	27'8	'95
65	do. tessellaris ...	F. v. M.	Carabene ...	5	12	...	48	19	...	20'62	'72
47	do. intermedia ...	R. T. B.	Bastard Bloodwood ...	5	9	I	16	...	...	25'66	'89
62	do. melliodora ...	A. Cunn.	Yellow Box ...	5	7	I	55	...	...	28'13	'98
30	do. viridis ...	R. T. B.	Green Mallee ...	5	4	I	25	...	...	32'17	1'12
36	Tristania conferta ...	R. Br.	Brush Box ...	5	2	...	53	25	...	26'19	'91
105	Eucalyptus Rossii ...	R. T. B., H. G. S.	White Gum ...	4	50	I	3	...	...	24'35	'85
4	do. crebra ...	F. v. M.	Small-leaf Ironbark ...	4	48	...	45	...	...	28'19	'98
20	do. corymbosa ...	Sm.	Bloodwood ...	4	47	...	45	...	...	22'58	'79
26	do. pilularis ...	Sm.	Blackbutt ...	4	47	...	...	...	...	23'96	'83
58	do. paludosa ...	R. T. B.	Yellow or Swamp Gum ...	4	38	...	46	...	...	24'61	'86
63	do. angophoroides ...	R. T. B.	Apple Top Box ...	4	38	I	24	12	...	23'62	'82
95	do. gracilis ...	F. v. M.	Mallee ...	4	38	I	15	8	...	29'32	1'02
41	do. gonicalyx ...	F. v. M.	Mountain Gum ...	4	30	...	50	...	...	19'00	'66
109	do. maculata ...	Hook	Spotted Gum ...	4	23	I	12	3	...	25'95	'90
56	do. globulus ...	Labill.	Tasmanian Blue Gum ...	4	18	2	40	...	...	22'22	'77
13	do. populifolia ...	Hook	Bimbal Box ...	4	15	I	15	...	...	29'94	1'04
70	Stenocarpus salignus ...	R. Br.	Beefwood ...	4	8	I	10	...	...	25'52	'89
88	Eucalyptus viminalis ...	Labill.	Manna Gum ...	4	5	...	50	...	...	19'67	'68
27	do. robusta ...	Sm.	Swamp Mahogany ...	4	5	...	55	...	...	22'14	'77
89	do. botryoides ...	A. Cunn.	Bull Mallee ...	4	4	I	18	20	...	27'99	'97
91	Quercus sp. ...	Sm.	Bangalay ...	4	4	I	29	II	...	21'70	'75
107	Eucalyptus piperita ...	Sm.	Danzic Oak (Europe) ...	4	1	I	29	II	...	21'36	'74
71	do. hemilampra ...	Sm.	Sydney Peppermint ...	4	1	I	41	...	...	19'67	'68
23	Pseudotsuga Douglassii ...	F. v. M.	Bastard Mahogany ...	3	59	...	45	...	...	20'07	'70
99	Acacia salicina ...	Britton	Oregon (U.S.A.) ...	3	57	...	48	...	...	17'78	'62
48	Eucalyptus Delegatensis ...	Lindl.	Cumung ...	3	54	...	...	I	...	22'06	'77
98	do. fraxinoides ...	R. T. B.	Mountain Ash ...	3	46	2	30	...	...	18'15	'63
97	Angophora intermedia ...	H. D., J. H. M.	White Ash ...	3	46	...	59	...	...	17'61	'61
57	do. melanoxylon ...	D. C.	Apple Tree ...	3	45	...	48	17	...	20'41	'71
103	Eucalyptus diversicolor ...	R. T. B.	Coalbark or Apple ...	3	43	...	58	20	...	25'57	'89
49	Callistix calcarata ...	F. v. M.	Karri (W.A.) ...	3	41	...	51	...	...	20'62	'72
84	Eucalyptus radiata ...	R. Br.	Black Pine ...	3	37	I	40	18	...	21'16	'74
33	do. Cambagei ...	Sieb.	Silver Top ...	3	36	I	10	I	...	20'95	'73
116	Melaleuca leucadendron ...	H. D., J. H. M.	Bastard Box or Bundy ...	3	34	...	58	13	...	21'55	'75
83	Flindersia australis ...	Linn.	Tea Tree ...	3	34	I	10	17	...	21'82	'76
100	Scolopia Brownei ...	R. Br.	Mountain Ash ...	3	32	I	2	8	...	18'12	'63
104	Eucalyptus calophylla ...	F. v. M.	Brush Cherry ...	3	30	...	39	17	...	24'95	'87
87	Geijera salicifolia ...	R. Br.	Red Gum (W.A.) ...	3	27	I	12	14	...	20'74	'70
6	do. Greivillea robusta ...	Schoott	Axe Breaker ...	3	26	I	I	15	...	25'52	'89
113	Tectona grandis ...	A. Cunn.	Silky Oak ...	3	24	...	50	12	30	18'53	'64
110	Pinus sylvestris ...	Linn.	Teak (Burma) ...	3	23	...	42	14	...	15'10	'57
69	Eucalyptus fastigata ...	Linn.	Red Deal (Baltic) ...	3	21	I	8	...	...	15'37	'54
16	do. oreades ...	H. D., J. H. M.	Cut Tail ...	3	19	...	51	...	...	19'80	'62
22	Pinus australis ...	R. T. B.	Mountain Ash ...	3	16	I	25	...	...	17'38	'60
76	Dysoxylon Muellieri ...	Mich.	Pitch Pine ...	3	12	...	31	26	...	16'19	'56
32	Eucalyptus amygdalina ...	Benth.	Red Bean ...	3	12	...	55	...	...	15'25	'53
101	Callistix robusta ...	Labill.	Messmate ...	3	10	I	35	...	...	19'42	'67
73	Dysoxylon Fraserianum ...	A. Cunn.	White Pine ...	3	7	...	30	15	...	18'46	'64
37	Agathis australis ...	R. Br.	Rosewood ...	3	5	...	29	4	...	15'29	'53
112	Quercus alba ...	Salisb.	Kauri (N.Z.) ...	3	4	...	46	20	...	18'10	'61
75	Castanopsis permur australe	Linn.	White Oak (U.S.A.) ...	3	1	...	47	3	...	16'13	'56
111	Quercus robur ...	A. Cunn.	Black Bean ...	2	52	I	40	...	...	18'02	'63
106	Fagus Cunninghamii ...	...	Oak (England) ...	2	49	...	45	16	...	16'19	'56
86	Stenocarpus sinuatus ...	Hook	Beech or Red Myrtle (Tas.) ...	2	47	...	31	2	...	15'04	'52
114	Juglans sp. ...	Endl.	Fire Tree ...	2	44	...	50	10	...	15'98	'55
79	Cedrela australis ...	...	Walnut (U.S.A.) ...	2	42	I	21	II	...	17'17	'60
90	Capparis nobilis ...	F. v. M.	Red Cedar ...	2	40	...	19	2	...	10'70	'37
85	Orites excelsa ...	F. v. M.	Wild Lemon ...	2	39	...	19	17	...	19'04	'66
77	Gmelina Leichardtii ...	R. Br.	Silky Oak ...	2	35	...	45	5	...	16'70	'58
208	Elaeocarpus grandis ...	F. v. M.	Beech ...	2	31	...	35	10	...	16'79	'58
81	Ceratopetalum apetalum ...	F. v. M.	Large Blue Fig ...	2	30	...	51	I	...	11'98	'41
96	Fagus sylvatica ...	D. Don	Coachwood ...	2	29	...	35	12	...	16'06	'56
74	Sequoia sempervirens ...	Linn.	Beech (England) ...	2	25	...	6	15	...	16'72	'58
72	Acacia melanoxylon ...	Lindl. & Gord.	Redwood (U.S.A.) ...	2	24	...	36	2	...	11'94	'41
72	Araucaria Cunninghamii ...	R. Br.	Blackwood ...	2	21	...	26	2	...	14'52	'47
78	Litsea reticulata ...	Ait.	Colonial Pine ...	2	14	...	45	5	...	13'51	'50
115	Kahikatea ...	Meissn.	She Beech or Bolly Gum ...	2	11	I	23	7	...	13'23	'46
			White Pine (N.Z.) ...	2	I	46	...	10	...	9'44	'33

AUTOMATIC SPRINKLERS.

THE introduction of automatic sprinklers is gradually becoming so common that the time has really arrived when architects and engineers should accord some attention not only to the question of introducing sprinklers generally, but investigating the character of the sprinklers used.

At the moment they are guided entirely by the reports of the Fire Offices Committee, who either pass the sprinkler as efficient for insurance purposes, or not, without giving the whys and wherefores or any particulars regarding the character of the tests they undertake.

Some time back we published a report of an automatic sprinkler in respect to which a test was undertaken by the British Fire Prevention Committee, and their methods of testing such appliances was thus explained.

We find, however, that the American practice of investigating automatic sprinklers is far more elaborate, and, having regard to this, we think it should be of common interest to architects engaged in the erection of business premises to have some information regarding American practice, and for this purpose we are presenting herewith a specimen specification of what is required in the way of tests by the insurance corporations of the United States:—

I. HYDROSTATIC PRESSURE.

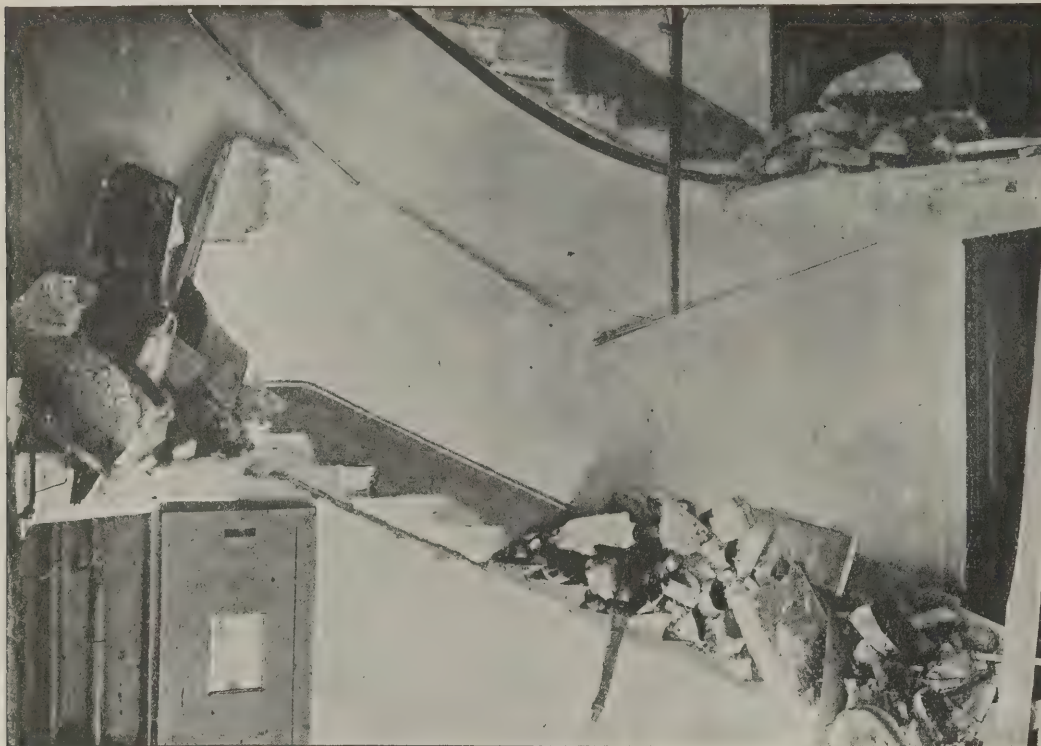
(a) LEAKAGE.—One hundred (100) sprinklers are connected one at a time in a pendant position to a hand-wheel hydrostatic pressure ram equipped with a spring gauge reading from 0 to 2,400 lb. per sq. in., and water is brought in contact with their seats.

Readings of leaking points are taken and the average computed. The highest, lowest and number leaking below 300 lbs. are noted. Second readings are taken at intervals varying from 30 to 300 days, the average again computed, and the highest, lowest and number leaking below 300 lbs. again noted.

(b) N.B.—Spring gauges. The gauge used in the foregoing tests and all spring gauges used in the following tests and as parts of all apparatus are calibrated after each experiment, a Crosby gravity-operated gauge tester being used for the purpose. All readings given are corrected readings.

(c) STEADY PRESSURE.—The sprinklers are connected to a heavy L-shaped cylinder, the upper end of which is used as an expansion air chamber. A constant hydrostatic pressure of 300 lbs. per sq. in. is maintained on these sprinklers for a period of 3,700 hours and notation made of any leakage under these conditions.

(d) WATER HAMMER.—The sprinklers



ONE OF THE STONE STAIRCASES THAT COLLAPSED.

13. HOT FLUID.

(a) FUSING POINT IN WATER. — Standard-degree sprinklers are immersed in 1 gallon of water held in a granite-ware vessel, and the temperature of the water is gradually raised to 100 degs. Fahr. (+ 38 degs. C.). Above this point the temperature is raised at a rate not exceeding 2 degs. Fahr. (1.1 degs. C.) per minute, the water being stirred to ensure uniformity. Temperatures are measured by 600-deg. Weiskopf thermometers, the bulbs of which are adjusted on a level with the soldered links of all the sprinklers. The thermometers, the gas flame used for heat and all of the apparatus are protected from draughts of air. Readings are taken of the temperatures recorded by the thermometers when the sprinklers open, and their actions in opening are noted.

(b) PLUNGE IN WATER. — Standard-degree sprinklers are allowed to stand for at least one hour in an enclosure having a constant temperature of 60 degs. Fahr. They are then quickly removed and immersed one at a time in a pendant position in a water bath having a constant temperature of 170 degs. Fahr. (+ 77 degs. C.). Readings are taken of the time elapsing before operation, and their action in opening is noted.

(c) FUSING POINT IN OIL. — High-degree sprinklers are immersed in 1 gallon of melted leaf lard held in a granite-ware vessel, and the temperature of the oil is gradually raised to 150 degs. Fahr. (+ 66 degs. C.). Above this point the temperature is raised at a rate not exceeding 2 degs. Fahr. per minute, the oil being stirred frequently to ensure uniformity.

Temperatures are read from 600-deg. Weiskopf thermometers whose bulbs are adjusted on a level with the soldered links of all the sprinklers. The thermometers, the gas flame used for heat and all of the apparatus are protected from draughts of air. Readings are taken of the temperatures recorded by the thermometers when the sprinklers open, and their actions in opening are noted.

4. RECORD OF DISTRIBUTION.

5. DESIGN AND CONSTRUCTION.

- (a) Effects of blows.
- (b) Effects of excessive tension or compression.
- (c) Uniformity of parts and workmanship.

6. MISCELLANEOUS.

7. RECORD IN SERVICE.

Notations are made of—

- (a) Number of sprinklers in actual service at date of test.
- (b) Greatest length of time any individual risk has been equipped.
- (c) Field record.

8. SUMMARY.

THE FIRE AT THE "COMEDIE FRANCAISE," PARIS.

IT is generally exceedingly difficult to obtain useful particulars of any theatre-fire, and frequently months or even years elapse until it is possible to present anything like a plain unvarnished picture of a fire of this kind. There is the sentimental aspect, generally due to the loss of life; there is the official aspect, generally due to a desire on the part of the public officials to make capital out of the fire for furthering future legis-

lative schemes; there is the managerial aspect, due to a desire to show the excellent condition of the theatre at the time of the outbreak. In fact, no fire is surrounded by so much mystery as a theatre-fire.

To-day, some years after the fire, we can, however, safely present a translation of the actual occurrences at the Theatre Francaise fire, which at the time created such a sensation, acrimonious discussion and mud-throwing in Paris. Fortunately the fire was midday, when the public were not in the building, and there was only one fatality. There was thus nothing very frightful about this fire. It was, as a matter of fact, a very commonplace one. But, for all that, it demonstrated some forcible lessons.

We illustrate the particulars with some excellent photographs, of the fire in actual operation and of the ruins of the auditorium. We also publish a plan and smaller view. We trust that particulars and illustrations together may prove instructive.

The Fire.

(Translated from the French.)

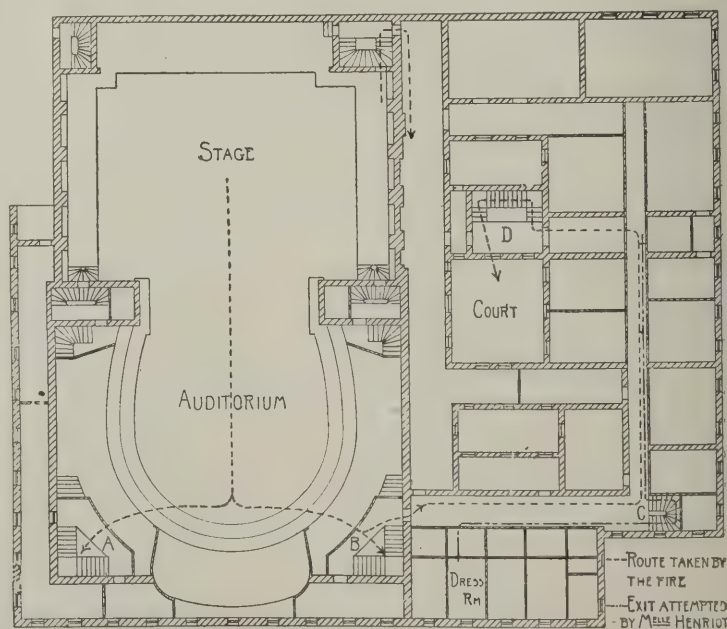
The exact hour at which the Comedie Francaise fire broke out is not known, nor has its cause ever been ascertained. Both commencement and cause thus curiously remain a mystery. Telephone and "fire-calls" messages both from the theatre and adjoining property were received by the fire brigade in rapid succession and resulted in the firemen attending in great force.

In the interior almost every hydrant was brought into immediate operation. Externally however it was difficult to get to work owing to the height of the building, and it was probably the delay in getting to work on the roof that caused popular opinion to decry a supposed lack of water. Owing to the danger of the spread of the flames to adjoining property

(the Cour des Comptes et le Conseil d'Etat) six additional heavy steam fire-engines were brought to the scene of the fire solely for the protection of adjacent risks.

The fire rapidly spread to the scenery store, the stage and the auditorium, the flames getting through wherever they had a chance to. From there the fire worked its way through the upper floor to the stone staircases (A and B), and these stairs were not long in giving way. At the third and fourth storeys on staircase "B" there were unfortunately means of communication by iron doors to the dressing-room wing, and these doors were open. These opened on the passage leading directly on to the dressing-rooms. The flames passing through these doorways,

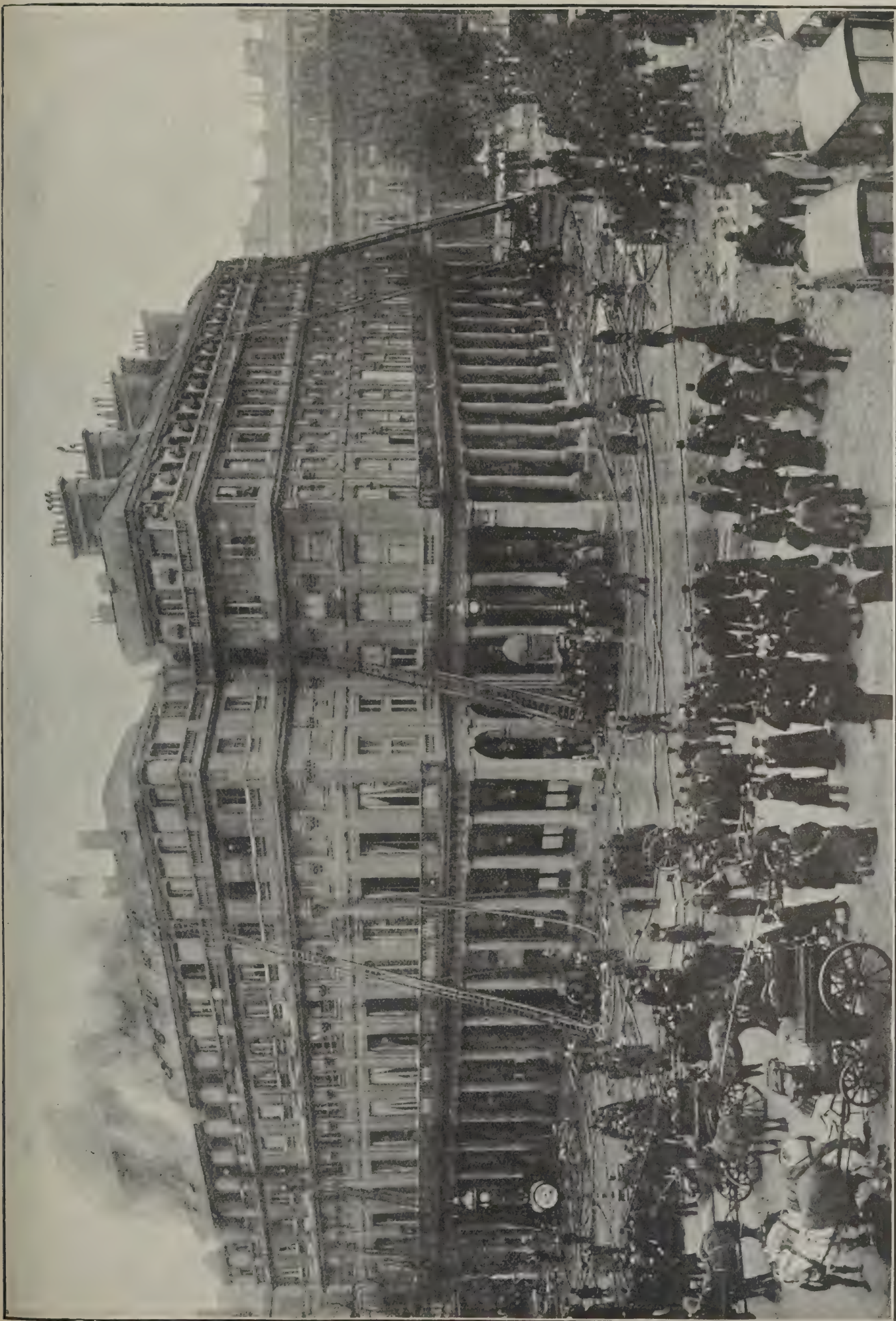
THÉÂTRE FRANÇAIS [PLAN OF 3^d AND 4th FLOOR]



1028

10 0 10 20 30 40 50
feet

PLAN OF THE THEATRE AT THE TIME OF THE FIRE.



THE FIRE AT THE THEATRE FRANCAISE PARIS. (Showing the actual fire in progress).

entirely destroyed the passages, *i.e.*, to a distance of 40 m. (about 130ft.). Thus the whole of the side of the theatre towards the Place du Theatre Français was damaged, as well as the part facing the Rue Saint Honoré. These iron doors were doubtless always kept open, as they are the means of communication to the Rue Richelieu (including all the offices of the theatre) and that part of the theatre opening on the Rue Saint Honoré. The fire also spread to the third floor and the wardrobe room by an iron door which had been wedged open, and this store was considerably damaged. Dressing-room No. 42 (belonging to Mlle. Henriot) was situated on the fourth floor in that part of the theatre facing the Rue Richelieu and in close proximity to staircase "B." The unfortunate artist was unable to avail herself of this staircase because the current of smoke and flame was apparently against her. She descended one floor and reached a dressing-

room on the third floor, intending to gain staircase "D," but was overcome here at a point indicated by a cross on the plan. If this artist had descended to the second floor by staircase "C" she could have saved herself, as the second floor had not been touched. She might also have been saved if she had remained in her dressing-room and shut the door, as she could have been rescued from her window.

The Lessons.

Among the lessons of this fire to which those in authority called attention at the time were the following points:—(1) The advisability of always keeping the iron doors closed. (2) The poor resistance offered by the stone staircases—all four fell in. (3) The resistance of good plasterwork on metal lathing. (4) That the great force of men working from hydrants which were brought to bear on the stage enabled the fire on that part of the house to be extinguished almost

immediately; much of the ironwork was left intact. (5) That the principal emergency exits from the auditorium remained in perfect condition.

It should be mentioned here that the Theatre de la Comedie Française was equipped at the time with all the necessary means of escape enforced by the regulations, namely, also with two fire-alarm call-points communicating with the Jean Jacques Rousseau station, a "fireproof" curtain, and a ventilation opening over the stage. The facilities for calling the brigade brought it on the spot in great strength in a remarkably short time, so that the call facilities may be said to have saved the theatre. The curtain did not come into operation, and the photograph on this page shows it still in position over the proscenium opening. Owing to the immediate strength of the fire brigade the fire was mastered in a comparatively short time. Only the stage and auditorium were gutted.



VIEW OF AUDITORIUM AND STAGE DIRECTLY AFTER THE FIRE. (THE FIRE-RESISTING CURTAIN CAN BE SEEN UNUSED.)

UNIVERSAL STANDARDS OF FIRE RESISTANCE.

QUESTIONS are frequently addressed to us as to the exact standards of fire resistance as universally adopted after the great Fire Prevention Congress of 1903, and questions are also frequently asked as to how they were arrived at. We are thus presenting in this article a copy of the actual resolutions of the Congress of 1903, with the standards of fire resistance in respect to floors, partitions and doors. We are also giving, as far as we are able and on the best authority, particulars as to how the standards were arrived at.

The Term "Fireproof."

The Executive of the British Fire Prevention Committee having as far back as 1901 given their careful consideration to the common misuse of the term "fireproof," now indiscriminately and often unsuitably applied to many building materials and systems of building construction in use in Great Britain, came to the conclusion that the avoidance of this term in general business, technical and legislative vocabulary was essential.

The Term "Fire-resisting."

The Executive considered the term "fire-resisting" more applicable for general use, and that it more correctly describes the varying qualities of different materials and systems of construction intended to resist the effect of fire for shorter or longer periods, at high or low temperatures, as the case may be, and they advocated the general adoption of this term in place of "fireproof."

Degrees of "Fire-resistance."

Further, the Executive, fully realizing the great variations in the fire-resisting qualities of materials and systems of construction, considered that the public, the professions concerned, and likewise the authorities controlling building operations, should clearly discriminate between the amount of protection obtainable or, in fact, requisite for different classes of property. For instance, the city warehouse filled with highly inflammable goods of great weight requires very different protection from the tenement house of the suburbs.

"Temporary," "Partial" and "Full" Protection.

The Executive were thus desirous of discriminating between fire-resisting materials and systems of construction affording temporary protection, partial protection and full protection against fire, and proposed to classify all building materials and systems of construction under these three headings. The exact and definite limit of these three classes was based in the first instance on the experience obtained from numerous investigations and tests, combined with the experience obtained from actual fires, and after due consideration of the limitations of building practice and the question of cost. The matter was discussed with the leading foreign authorities with the view of arriving at data acceptable in all countries.

Time Limits.

The Executive's minimum requirements of fire-resistance for building materials or systems of construction were put forward in the form of standard tables for (1) fire-resisting floors and ceilings, (2) fire-resisting partitions, (3) fire-resisting doors; but they could be more popularly summarized as follows by saying—

(a) That temporary protection implies resistance against fire for at least three-quarters of an hour to, say, one hour, according to circumstances.

(b) That partial protection implies resistance against a fierce fire for at least one hour and a half to two hours, according to circumstances.

(c) That full protection implies resistance against a fierce fire for at least two hours and a half to four hours, according to circumstances.

The actual minimum temperatures, thickness, questions of load, and the application of water can be appreciated from the tables by all technically interested, but for the popular discrimination the time standard alone will probably suffice.

The Standards.

The standards as proposed by the British Fire Prevention Committee, and adopted as universal standards at the International Congress, have in fact and practice become the universal standards in this country, on the Continent and in the United States, so that the same standardization may now be said to be common to all countries. In several instances the primary points of the classification have been adopted in legislation or local regulations, and as time goes on this legislative adoption is likely to become general.

The Universal Standards of Fire Resistance, as adopted by the International Fire-Prevention Congress, London, 1903.

The following were the Congress resolutions referring to the subject:—

Re the term "Fireproof."—The Congress

having given their consideration to the constant misuse of the term "fireproof," and its indiscriminate and unsuitable application to many building materials and systems in use, have come to the conclusion that the avoidance of this term in the general business and technical vocabulary is essential.

Re the term "Fire-resisting."—The Congress considers the term "fire-resisting" more applicable for general use, and that it more correctly describes the varying qualities of the different materials and systems of construction intended to resist the effect of fire for shorter or longer periods, at high or low temperatures, as the case may be; and it advocates the general adoption of this term in the place of the term "fireproof."

Re Standards of Fire Resistance.—The Congress confirms the British Fire Prevention Committee's proposed standards of fire-resistance, and hereby resolves that the universal standards of fire resistance shall in future be:—(1) Temporary protection; (2) Partial protection; (3) Full protection; in accordance with the Committee's schedule.

Standard Table for Fire-resisting Floors and Ceilings.

Classification.	Sub-class.	Duration of test at least.	Minimum temperature.	Load per superficial foot distributed	Minimum superficial area under test.	Minimum time for application of water under pressure.
				per sq. metre.		
Temporary protection	Class A	45 mins.	1500° F. (815.5° C.)	*Optional	100 sq. ft. (9.290 sq. m.)	2 mins.
	Class B	60 mins.	1500° F. (815.5° C.)	Optional	200 sq. ft. (18.580 sq. m.)	2 mins.
Partial protection	Class A	90 mins.	1800° F. (982.2° C.)	112 lbs. (51.2 kg.)	100 sq. ft. (9.290 sq. m.)	2 mins.
	Class B	120 mins.	1800° F. (982.2° C.)	168 lbs. (820.278 kg.)	200 sq. ft. (18.580 sq. m.)	2 mins.
Full protection	Class A	150 mins.	1800° F. (982.2° C.)	224 lbs. (1093.706 kg.)	100 sq. ft. (9.290 sq. m.)	2 mins.
	Class B	240 mins.	1800° F. (982.2° C.)	280 lbs. (1367.130 kg.)	200 sq. ft. (18.580 sq. m.)	5 mins.

Kg.—Kilogramme.

Standard Table for Fire-resisting Partitions.

Classification.	Sub-class.	Duration of test at least.	Minimum temperature.	Thickness of material.	Minimum superficial area under test.	Minimum time for application of water under pressure.
Temporary protection	Class A	45 mins.	1500° F. (815.5° C.)	2 ins. and under (.051 m.)	80 sq. ft. (7.432 sq. m.)	2 mins.
	Class B	60 mins.	1500° F. (815.5° C.)	Optional	80 sq. ft. (7.432 sq. m.)	2 mins.
Partial protection	Class A	90 mins.	1800° F. (982.2° C.)	2½ ins. and under (.063 m.)	80 sq. ft. (7.432 sq. m.)	2 mins.
	Class B	120 mins.	1800° F. (982.2° C.)	Optional	80 sq. ft. (7.432 sq. m.)	2 mins.
Full protection	Class A	150 mins.	1800° F. (982.2° C.)	2½ ins. and under (.063 m.)	80 sq. ft. (7.432 sq. m.)	2 mins.
	Class B	240 mins.	1800° F. (982.2° C.)	Optional	80 sq. ft. (7.432 sq. m.)	5 mins.

Standard Table for Fire-resisting Single Doors, with or without Frames.

Classification.	Sub-class.	Duration of test at least.	Minimum temperature.	Thickness of material.	Minimum superficial area under test.	Minimum time for application of water under pressure.
Temporary protection	Class A	45 mins.	1500° F. (815.5° C.)	2 ins. and under (.051 m.)	20 sq. ft. (1.858 sq. m.)	2 mins.
	Class B	60 mins.	1500° F. (815.5° C.)	Optional	20 sq. ft. (1.858 sq. m.)	2 mins.
Partial protection	Class A	90 mins.	1800° F. (982.2° C.)	2½ ins. and under (.063 m.)	20 sq. ft. (1.858 sq. m.)	2 mins.
	Class B	120 mins.	1800° F. (982.2° C.)	Optional	20 sq. ft. (1.858 sq. m.)	2 mins.
Full protection	Class A	150 mins.	1800° F. (982.2° C.)	¾ in. and under (.018 m.)	25 sq. ft. (2.322 sq. m.)	2 mins.
	Class B	240 mins.	1800° F. (982.2° C.)	Optional	25 sq. ft. (2.322 sq. m.)	5 mins.

A BREMEN SUB-FIRE-STATION.

THE new sub-station of the Bremen Fire Brigade is above the average for fire-stations of this description, and we accordingly present some illustrations by the courtesy of the chief officer, Herr Dittman. It will be observed that the sub-station is planned on an open site, and that the engine-house is so arranged as to have the stables at the back, whilst the whole of the officers' and men's rooms are in a wing. The architectural treatment of the building is also above the average for fire-stations, and accords with the local ideas.

FIRE TESTS.

Tests with Various Concrete Aggregates.

AN important series of official fire tests with concrete aggregates is to be undertaken by the British Fire Prevention Committee in co-operation with the Associated Portland Cement Manufacturers, Ltd.

At a period when practically the whole of the technical world is discussing problems relating to concrete and ferro-concrete it is of absolute importance that the true facts as to the fire-resistance of the various aggregates of concrete should be definitely and independently ascertained irrespective of any system for its application as ferro-concrete or otherwise. It is common knowledge among those interested in the subject of fire-resistance that the value of concrete varies materially according to its aggregate in actual fire. The professional man generally and the public still speak of concrete irrespective of the actual aggregate, not even discriminating between clinker concrete and ballast concrete, although the difference between these two aggregates is enormous.

The tests, we understand, will be with the following aggregates of concrete, namely:— (1) Blast furnace slag, (2) broken bricks, (3) broken granite, (4) burnt ballast, (5) coke breeze, (6) furnace clinker and (7) Thames ballast. After these seven tests have been undertaken it is not improbable that further tests will also be undertaken.

Tests with Armoured Concrete.

We understand that among the tests with proprietary systems to be undertaken during the early autumn will be a test with an armoured concrete floor by Messrs. Coignet, of Paris. This will be the first armoured concrete floor under investigation in this country, and having in mind the extraordinary manner in which the question of protecting the metal rods in armoured concrete is generally overlooked by the majority of firms associated with armoured-concrete work, it will be a matter of considerable interest to see the results of the test mentioned.

Fire Tests in August.

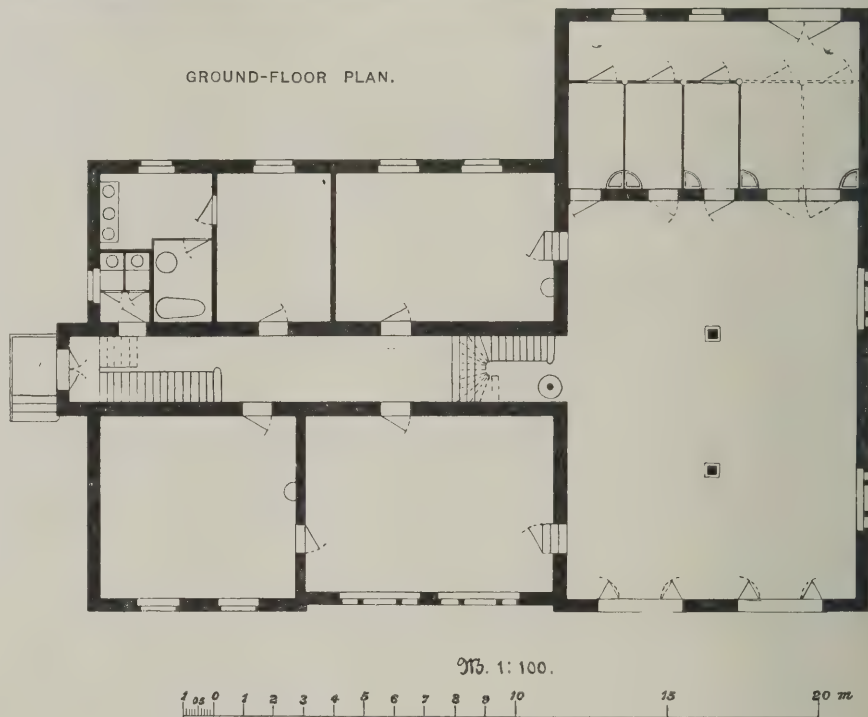
During the early part of August the Committee propose testing in rotation the following proprietary systems of construction, namely, an armoured porous terra-cotta floor of roft, span constructed by Messrs. Faber, of Berlin; a roller shutter on the Kinnear system (U.S.A.), erected by Messrs. Arthur L. Gibson & Co., of London; and a zin. terra-cotta partition by the National Fireproofing Co., of U.S.A. There will also be an experimental test by the Committee with a heavy concrete floor supported by broad flange girders, provided by Messrs. H. J. Skelton & Co., of London. It is anticipated that the whole of these tests will be undertaken on one day.

The Testing Station Sub-Committee.

The following are the names of additional members of the testing arrangements sub-committee of the British Fire Prevention Committee:—Lieut.-Colonel Winn, R.E., Mr. A. T. Walmisley, M.I.C.E., Mr. Oswald C. Wylson, F.R.I.B.A., and Mr. Frank Macey, architect.



GROUND-FLOOR PLAN.



A NEW SUB-STATION OF THE BREMEN FIRE BRIGADE.

THE NATIONAL FIRE PROTECTION OF THE UNITED STATES.

THE National Fire Protection Association of the United States held their annual meeting at New York at the end of May, and the proceedings have now been issued. They comprise an octavo volume of over 300 pages.

The Society is primarily the outcome of a wish on the part of the insurance experts to reduce the fire risk in the United States rather than the outcome of a wish on the part of public authorities and professional men to encourage fire prevention, and thus the American membership primarily comprises insurance men. The American Institution of Architects, the American Society of Mechanical Engineers, and the International Association of Fire Engineers, are however officially associated with this organization. Mr. Hexamer of Philadelphia, who visited London in 1903, is the president, and Mr. Merrill, of the Chicago Fire Underwriters Laboratories, is the secretary.

A large number of important questions were discussed by the association at their meeting, such as matters dealing with automatic sprinklers; the protection of tramway car-sheds; the use of cement in building construction; the standards of fire protection in

factories; the use of electrical rotary and steam fire-pumps; the standard thread for fire hose couplings; theatre construction and equipment, and protective coverings for window and door openings.

In most cases the work had been prepared prior to the meeting by sub-committees. The sub-committees brought forward reports for consideration and discussion, and most of these reports had been printed in proof prior to the meeting.

The Berlin Police Prefect has been studying the police and general administrative arrangements of London, including questions relating to fire-prevention, the Building Act and theatre-safety. He visited the London Fire Brigade and the London Salvage Corps. He also inspected a number of theatres under the guidance of the chairman of the British Fire Prevention Committee. He accorded particular attention to the Apollo Theatre, where he was met by Mr. Lewen Sharpe, the architect of the theatre, who is at present also chairman of the fire brigades committee of the London County Council. He also examined the question of flame-proof scenery as demonstrated at the Alhambra Theatre by Mr. Alfred Moul.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

August 9, 1905. Vol. 22, No. 548.

6, Great New Street, Fetter Lane, E.C.

Summary.

Mr. E. G. Rivers, M.I.C.E., draws attention to the desirability of the heating engineer being associated with the architect of a new building at the very earliest stage, *i.e.*, when the sketch plans are being prepared. Ventilating and heating arrangements are too often viewed in the same light as the furniture and fittings of a building—in many cases no provisions being made by the architect beyond the inevitable boiler-house and "Tobin tubes" in the larger rooms. Mr. Rivers inclines to the opinion that a computation based upon the 30ft. or minimum scale of air per person per minute is sufficient if the air is of good quality. (Page 80.)

The breaking weight of a timber beam may be found by the equation $BW = \frac{b \times d^2 \times c}{L}$, where BW = central breaking weight in lbs. by experiment, L = length or span in feet, b = breadth of beam in inches and d = depth of beam in inches. (Page 81.)

We think that, however successful the Cheap Cottages Exhibition may be from the promoters' point of view, or in the way of an advertisement for competitors, it must be written down a failure in so far as concerns the solution of the problem of housing the agricultural labourer. (Page 74.)

Heat and the holiday season combined to rob the London timber trade of all animation during July, and nothing beyond hand-to-mouth business can now be expected until the concluding quarter of the year. (Page 85.)

The competition for a new town hall, municipal offices, &c., at Dartmouth is unsatisfactory because there is no assurance that an assessor will be appointed, and the council reserve the right to make plans embodying ideas that may be contained in either or all of the premiated designs. (Page 84.)

The rebuilding of St. Mark's Campanile, Venice, has now reached ground level, and the engineers hope to get several metres up during the autumn. Nearly all the pieces of the Loggetta have been found and can be put together. (Page 84.)

The L.C.C. Bill for the construction of tramways over Blackfriars and Waterloo Bridges and along the Embankment will be reintroduced in the next session of Parliament. (Page 84.)

Drawings prepared in the Architectural Association day school may be submitted in lieu of testimonies of study for the R.I.B.A. intermediate examination, and it is now proposed that students who have completed the four years' course shall be exempted from this examination. (Page 84.)

Week-end Cottages.

IN view of the continual expansion of cities and the increasing desire (of all those who are able) to get away from them after business hours, it seems likely that in the future a very great number of people will make the twofold arrangement of living in town during the working days of the week and spending their week-ends in cottages well outside the city. This, of course, is no new thing, as for long past the practice has been followed by many, but there is no doubt that the tendency of living outside the towns in which people are compelled to work is becoming very much more general, not only by reason of the fact that the air in towns is less beneficial than that outside, but also on account of the time which is wasted in going to and fro. In London especially this is the case, because a very great deal of time is lost in getting in and out of the city—this occupying in the majority of cases quite an hour each way—and as very often the suburban villa has neither the advantages of the house in the country nor of the house centrally situated in the town, we think it probable that a greater number of people will choose to live near their work for the most part of the week and then to go quite away for the week-end. In the event of such a development, the building of moderately cheap cottages would become a very prominent and important matter, and it is in that connection that the present exhibition at Letchworth is suggestive. In the future there is likely to be a newer problem—the housing, not only of the artisans, but of the middle "working" classes.

Foundations.

The majority of foundations with which an architect has to deal are of a simple kind, but now and again he is concerned with work of a difficult nature, and the question then arises as to whether this is not an engineer's province, in which case the architect may not be entitled to commission upon the work. There may be tidal difficulties to be overcome, pumping operations, coffer-dam construction, piling, &c., and it may be desirable to appoint an engineer specially qualified for the work. Of course foundations of this kind entail much expense, and an architect naturally does not wish to lose commission on the outlay. If the work has to be protected against tidal water by sheet piling, coffer-dams or cribs, the question is somewhat simpler, as it becomes nearer the engineer's province; but in other cases, such

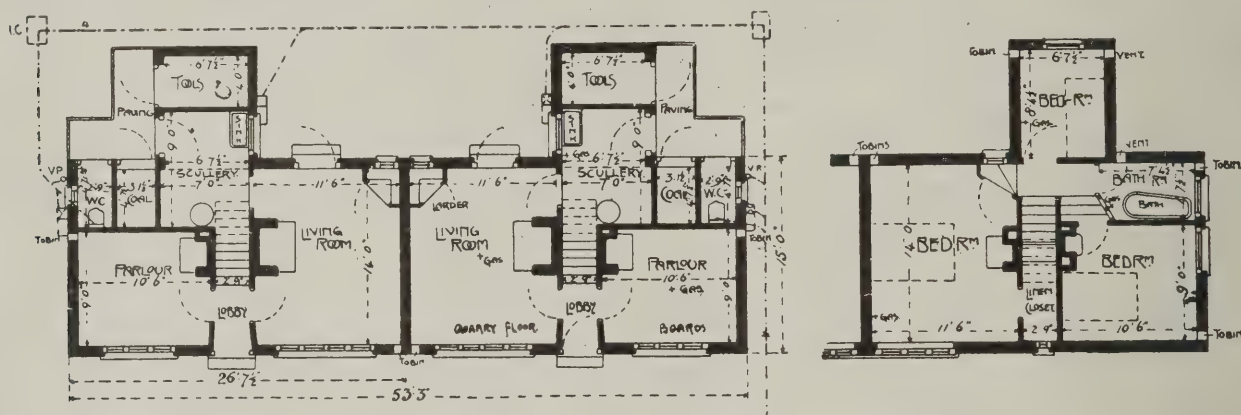
as quicksand or soft semi-liquid soils, requiring the use of pumps, pile-driving and grillages, although an architect is not so qualified as an engineer for the work it is not so far removed from his duties, and often is mixed up with problems of base-ments, which are a distinct part of the work of architectural design. In cases of this kind, where an architect must exercise a general control of the foundations, it seems only right that he should be entitled to claim the commission.

Everyday Practice.

Success in most occupations largely depends on efficient organization, a due relation of one part of the work to the other parts, so that there may be no friction or overlapping. A good deal of the professional architect's work is lacking in this quality. His earlier years are taken up with profitless studies of no practical value to him. His book and class studies bear very indirectly on the practical work he is called upon to undertake; he spends much of his time in drawing and sketching, which are of doubtful value to him and have little relation to the practice of his vocation. But it does not end here. When he begins to practise he finds the same want of relation, the same obstacles to his action in the requirements of clients, local authorities and builders. A great deal of his energy and ability is wasted on preliminary duties of not a very remunerative kind; he has to prepare plans and designs to suit various tastes before one is selected. The architect has the wrong client, or the client the wrong architect, for his particular wants. They do not suit each other. The fact is, as it often happens, the architect does not know his client well enough to design a house for him. Indeed, his position is often very dubious. Among ignorant persons there is a belief that architects are useless—that a builder is enough of an architect for all practical purposes. There was a case heard not very long ago in which an architect was cross-examined by counsel in this way:—"You are a builder, I believe?" "No, an architect." "Builder or architect, architect or builder, it is much the same thing, isn't it?" "No, not at all." "What is the difference?" The architect explained what the difference was, and counsel added: "Oh, very well. That will do. And now, after your very ingenious distinction without a difference, who was the architect of the Tower of Babel?" The architect smiled. "There was not one," he answered, "hence the confusion."



PAIR OF BRICK COTTAGES BY BOURNVILLE VILLAGE TRUST (COST £388) AND COTTAGE BY FIREPROOF PARTITION AND SPANDREL WALL CO. (BRICK-ON-EDGE, ROUGH-CAST, REINFORCED WITH IRONWORK: COST £256).



GROUND- AND FIRST-FLOOR PLANS OF COTTAGES BY BOURNVILLE VILLAGE TRUST.

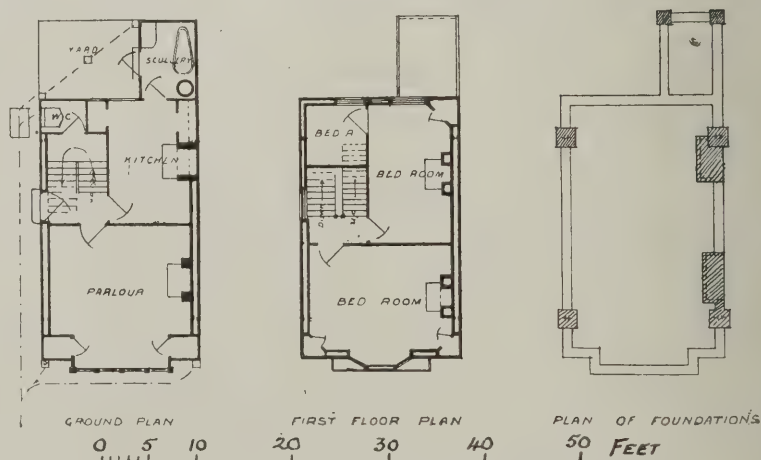
THE CHEAP COTTAGES EXHIBITION.

(Concluded from last week.)

IN this issue we give the remainder of our photographs, elevations and plans of representative cottages at the Cheap Cottages Exhibition now being held at Letchworth (Garden City). These cottages being of so many different materials, we have not attempted in this article to deal with them under inclusive headings, as in the article in our issue for last week, but have described each separately, adding to the end of the article our opinion on the merits and deficiencies of the exhibition in general.

Brick-on-edge and Iron Reinforcement.

The Fireproof Partition and Spandrel Wall Co., of 92, Tooley Street, S.E., have erected two cottages, one a bungalow, with all the rooms on the ground floor, costing £156 (4½d. per ft. cube), including drainage, &c., and the other a two-floor cottage costing £256 (5½d. per ft. cube), inclusive of drainage and fencing. The latter is illustrated on this page. The parlour (with grate and two cupboards) on the ground floor is 14ft. by 14ft.; kitchen (with range, cupboard and larder), 13ft. by 8ft. 6ins.; scullery (fitted with copper and bath), 8ft. by 6ft.; w.c.; and three bedrooms on the floor above, 15ft. by 11ft., 14ft. 6ins. by 8ft. 6ins., and 6ft. 6ins. by 6ft. 9ins.—all the rooms, on both floors, being 9ft. high. In the roof there is space for two more bedrooms and a store. The walls of these cottages are built of brick-on-edge,



PLANS OF COTTAGE BY FIREPROOF PARTITION AND SPANDREL WALL CO.

reinforced with ironwork and built in cement mortar. They are declared to be as strong as ordinary gin. walls, and self-supporting; foundations are required under the stanchions only. Damp-proofing is assured by the rough-cast outside and the hollow space inside, with additional protection by roofing felt, &c.

Cottages by the Bournville Village Trust.

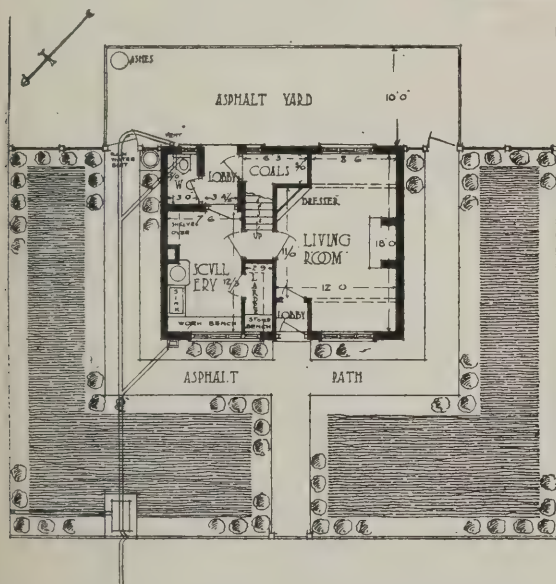
The Bournville Village Trust have erected a single cottage and a pair of cottages. The former (shown in the photograph on p. 76) contains a living-room, with oven-grate, 14ft. 6ins. by 11ft. 6ins. by 8ft. 3ins.;

parlour, with grate, 9ft. 1½ins. by 10ft. by 8ft. 3ins.; entrance lobby, coal-shed, larder; and bedrooms 11ft. 9ins. by 10ft. by 8ft., 11ft. 6ins. by 8ft. by 8ft., and 6ft. 3ins. by 11ft. 6ins. by 8ft. The cost of this cottage is put at £135 4s., or with bath £138 9s. The pair of cottages is shown in the photograph above. These comprise a living-room, with oven-grate, 14ft. by 11ft. 6ins. by 8ft. 3ins.; parlour, with grate, 10ft. 6ins. by 9ft. by 8ft. 3ins.; scullery, 9ft. by 7ft. by 7ft.; tool-house, 6ft. 7½ins. by 4ft. by 7ft.; coal-house, w.c., &c.; and bedrooms 14ft. by 11ft. 6ins. by 8ft., 10ft. 6ins. by 9ft. by 8ft., and

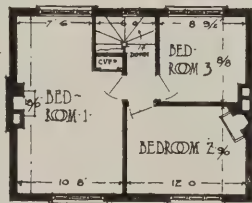
8ft. 4½ins. by 6ft. 7½ins. by 8ft. with a bathroom on this floor 7ft. 4½ins. by 4ft. 7½ins. by 8ft. The walls are of red bricks, 9ins. outside and 4½ins. inside; the floors are 1in. tongued and grooved boards and 9in. quarries; and the roofs are of Broseley tiles. The footings are of brickwork 18ins. wide, on solid bottom soil. The cost of the pair is put at £369 1s., or £387 19s. with baths; or 4½d. per ft. cube, say £31 per room. The cost of the single cottage is put at £135 4s., or £138 9s. with bath; gas-fittings (including stove) £2 10s. extra. The governing idea has been to give the maximum cubical contents at the least possible expense, compatible with good construction, and the selection of materials based on the Trust's experience in the erection of about 600 houses on the Bournville Estate near Birmingham. The total cost of the installation of the boiler at the rear of the oven-grate, tanks, piping, and bath with taps, &c., complete, is £10 per house. Tobin ventilators are provided in every room. The tool-houses form a valuable addition in the pair of cottages, while the doors opening on to the garden give the cottage-dweller the advantages of a larger property.

Brick and Rough-cast.

The cottage designed by Mr. Percy Houfton, of Chesterfield, for Messrs. Green Brothers, of the same town, contains a living-room with range (extreme measurements 18ft. by 12ft.); scullery with copper, 12ft. 3ins. by 7ft. 6ins.; larder, cupboard-dresser, coal-place, and w.c. opening into outer lobby; and three bedrooms, respectively 18ft. by 10ft. 8ins., 12ft. by 9ft., and 8ft. 9½ins. by 8ft. 8ins. The walls are of 9in. brickwork in mortar, cement rough-cast. The floor of the living-room is of quarries in cement, with granolithic cement for the rest of the ground floor, all being on a 6in. concrete bed. The roof is of local red tiles and the foundations are of brickwork in mortar twice the thickness of the walls. The inclusion of the coal-place, w.c. and open lobby within the rectangle of the ground



BRICK (ROUGH-CAST) COTTAGE
BY GREEN BROTHERS.



BEDROOM PLAN:

PERCY HOUTON, ARCHITECT.
COST £150.

plan provides, it is claimed, more space on the bedroom floor. The cost is put at £150, or about 3½d. per ft. cube, and it is stated that the building can be duplicated for about £175, including profit, architect's fees and men's travelling expenses.

Concrete Cottages.

Messrs. Potter & Co., Ltd., have erected the cottages illustrated on p. 79. The single cottage contains (all on the ground floor) a living-room 14ft. by 12ft.; scullery, 10ft. by 9ft.; three bedrooms, 12ft. by 8ft. 10ins., 10ft. by 8ft. 10ins. and 10ft. by 8ft. 6ins. The walls are of concrete, the outer walls 7ins.

and the division walls 9ins. thick. The floors of the living-room and bedrooms are of wood nailed direct to the concrete, those of the larder, lobby and scullery being of granolithic cement. The roof is of wood, and tiled, with the exception of the scullery, fuel place and w.c., which are of cement and concrete flats. The foundations are of Portland cement. The special features claimed are:—Walls of concrete and rough-cast; no special apparatus used; no wood joists or hollow spaces to ground floor, which is of 5ins. hard clinker and 5ins. Portland-cement concrete; avoidance of wood wherever likely

to decay. The cost is put at £150, exclusive of water-supply, drainage and carriage, or 4½d. per ft. cube.

Messrs. Potter's other exhibit is a pair of semi-detached cottages, each comprising—all on the ground floor—a living-room 14ft. by 12ft., with range; scullery, 10ft. by 9ft., with hob-grate; and three bedrooms, 12ft. by 8ft. 10ins., 10ft. by 8ft. 10ins., and 10ft. by 8ft. 6ins. The walls are of steel framing and plaster on expanded metal, 7ins. overall with a 3in. air-space between the inner and outer skins; the floors, roof and foundations are constructed similarly to the first cottage. The cost is put at £300, exclusive of water-supply, drainage and cartage. The advantages claimed are:—Quickness of construction, fire-resistance and durability.

A Cottage of Asbestos Bricks.

Mr. V. Dunkerley has designed some semi-detached cottages for the Asbestos Brick and Tile Co., Ltd., which each contain on two floors a living-room, with Corne's patent combination range of oven, fire and copper, 12ft. 10ins. by 11ft. 8ins. by 8ft. 6ins.; parlour, with register grate, 13ft. 6ins. by 11ft. by 8ft. 6ins.; scullery, with gas-stove or self-setting range, copper, and bath with hot- and cold-water supply, 11ft. by 7ft. 9ins. by 8ft. 6ins.; larder, coals, &c.; bedrooms, 12ft. 10ins. by 11ft. 8ins. by 8ft. 9ins., 11ft. by 9ft. 4ins. by 8ft. 9ins., 9ft. by 8ft. 1ins. by 8ft. 9ins.; and box-room. The external walls are of asbestos bricks, 9ins. thick, all internal partitions, excepting at fireplaces, being of "Mack" patent partition slabs. The ground floor is of 1½in. wood-block flooring laid on bitumen or concrete, and the first floors are of tongued and grooved boards. The roof is tiled, and the foundations concrete. The

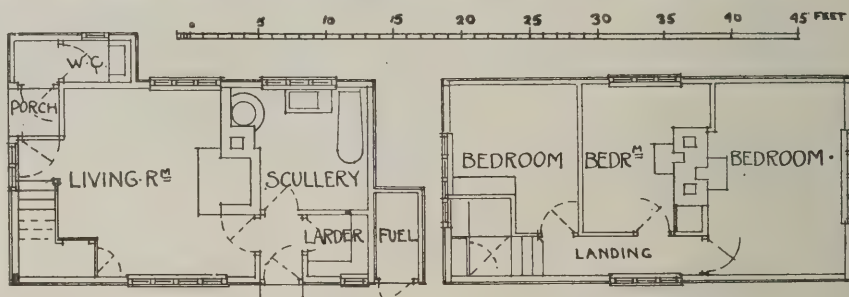


BRICK COTTAGE BY BOURNVILLE VILLAGE TRUST (COST £138) AND TIMBER COTTAGE BY LIONEL F. CRANE (£150).

elevations have been designed to show the adaptability and suitability of the asbestic brick, which is machine-made and composed of lime, sand and asbestos. This brick is well moulded and can be obtained in a variety of colours. The cost is put at £400, including builder's profit, &c., or 4½d. per ft. cube.

A Cottage of Timber and Damp-proof Sheeting.

The Wire-weave Roofing Co., of 108, Queen Victoria Street, E.C., have erected a labourer's cottage which comprises (all on the ground floor) a living-room 21ft. by 14ft. 6ins. by 8ft. 6ins., with dresser, cupboard and range; scullery 17ft. by 9ft., with copper and sink having hot- and cold-water supply; larder; back porch 10ft. by 7ft., with coal-house and earth-closet; and four water-butts. Of the three bedrooms, one measures 13ft. by 12ft., with cupboard, and the other two, with fireplaces, each 13ft. by 10ft. 6ins. The walls are of overlapping vertical boards, 1½ins. by 8ins.,



GROUND-PLAN.

BEDROOM-PLAN.

PLANS OF COTTAGE BY LIONEL F. CRANE.

interlined with "Ferol" sheeting and lined with matchboard covered with canvas and Hall's distemper. The floors consist of in. tongued and grooved pitch-pine boards carried on joists on brick sleeper walls, the roof being also of in. boards covered with

thick "Ferol" sheeting. This is claimed to be an essentially country cottage. The walls of the living-room and bedrooms have four separate thicknesses of non-conducting material, besides a 4in. air-space, to resist heat and cold. The cost is put at £150.



TIMBER COTTAGE BY WIRE-WOVE ROOFING COMPANY. COST £150.

Under the usual by-laws only the chimney of this cottage would be permitted, but the whole building might be erected under the 1903 Model By-Laws recommended by the Local Government Board.

Weather-boarding.

The cottage by Mr. Lionel F. Crane, of London, W., built by Mr. Frank Newton, of Hitchin, is illustrated on the opposite page. It contains on the ground floor a living-room 14ft. 6ins. by 12ft., with range; scullery, with bath, sink and copper, 8ft. 6ins. by 9ft. 3ins.; larder, cupboards, w.c., and fuel-shed; and on the floor above two bedrooms 10ft. 9ins. by 9ft. 6ins. and one bedroom 14ft. by 9ft. 3ins. The cottage is timber-framed, the studding being 6ins. by 2½ins. and the corner-posts 6ins. square. The weather-boarding is treated outside with Carbolineum Avenarius to prevent rotting. The floor of the living-room is of wood blocks on concrete, and those above of ordinary boards. The roof is of old local tiles on boarding and battens, and the foundations are of lime and cement concrete. The cost is put at £150, or 6d. per ft. cube. The furniture of this cottage is by Messrs. Heal & Son, of Tottenham Court Road, W.C., who have also furnished the cottage designed by Messrs. Smith & Brewer. The living-room furniture is of oak and the bedroom furniture of pine painted dark green with the hand-holes to drawers, &c., picked out in bright red.

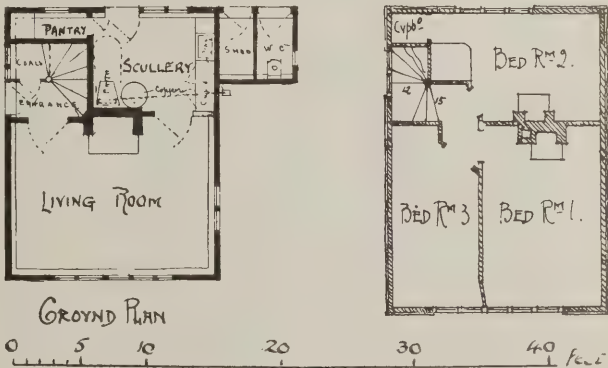
Mr. Oswald P. Milne, of 77, Chancery Lane, E.C., has endeavoured to produce a cottage that will be light, cheerful and comfortable to live in, as well as up-to-date in its arrangements. It is built on two floors and contains:—Living-room, with range, 15ft. 6ins. by 11ft. 4ins. by 7ft. 9ins.; scullery, with bath and copper, 9ft. 4ins. by 7ft. 6ins. by 7ft. 9ins.; bedrooms, 9ft. by 13ft. 4ins. by 9ft., 6ft. 2ins. by 13ft. 4ins. by 9ft., 12ft. by 8ft. 6ins. by 9ft.; pantry, two cupboards, coal and wood sheds, w.c., &c. The walls are of 9in. brickwork for 18ins. up from the ground level; above, 4in. studding covered on the outside with plaster to a height of 8ft.; weather-boarded and plastered on the inside. Floors of scullery and pantry tiled;



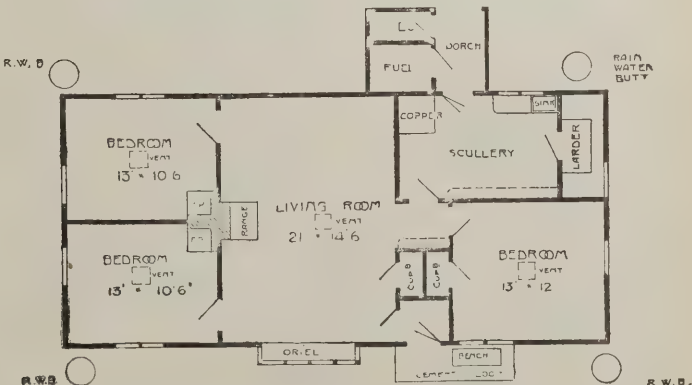
COTTAGE BY OSWALD P. MILNE. BRICK ROUGH-CAST AND WEATHER-BOARDING COST £149.



LIVING-ROOM IN COTTAGE BY LIONEL CRANE: FURNITURE BY HEAL AND SON.



PLANS OF COTTAGE BY OSWALD P. MILNE.



PLAN OF COTTAGE BY WIRE-WOVE ROOFING COMPANY.

the rest boarded. The foundations are of concrete 15ins. deep under the walls and 6ins. thick over the whole site. The roof is covered with red tiles. The prime cost is put at £133 without bath and hot-water supply, and £149 with this.

Co-operative Cottages.

The Co-operative Tenants' Housing Council, Ltd. (Garden City tenants) have erected the pair of cottages illustrated below. The cost of these is put at £300, or 4d. per ft. cube. On the ground floor there is a living-room 16ft. by 13ft. 6ins. by 8ft., fitted with range; scullery, 11ft. 6ins. by 8ft. 6ins. by 7ft. 9ins., with bath, copper and sink; tool-cupboard, pantry, coal-house and w.c.; and bedrooms 5ft. by 10ft. 6ins., 12ft. 6ins. by 9ft., and 12ft. 6ins. by 8ft.—each 8ft. high. The walls are of gin. brickwork, rough-cast, the roof is tiled, and the ground floor concreted. The foundations are of gin. Portland cement concrete, with blue bricks,

vitri-fied, under asphalt damp-course. The front faces south-west. It will be seen from the block plan that it is intended to erect a group of these cottages around a green.

Messrs. Henman & Cooper's Cottages.

Mr. William Henman, F.R.I.B.A., and Mr. Thomas Cooper, F.R.I.B.A., of Birmingham, have designed the single cottage and pair of cottages illustrated on p. 79. These contain (all on the ground floor) a living-room 14ft. by 11ft. 9ins. by 9ft., with a bay window, range fireplace, sink recess, fuel-place and w.c.; and three bedrooms, each 7ft. by 7ft. by 9ft. The walls are one brick thick, the floors being boarded in the living-room and the bedrooms, and tiled elsewhere. The roof is tiled and the foundations are of brick. The cost is put at £100 per cottage, the object of the architects being to provide healthy, self-contained, economical dwellings for the working poor, at a low rent.

Conclusions.

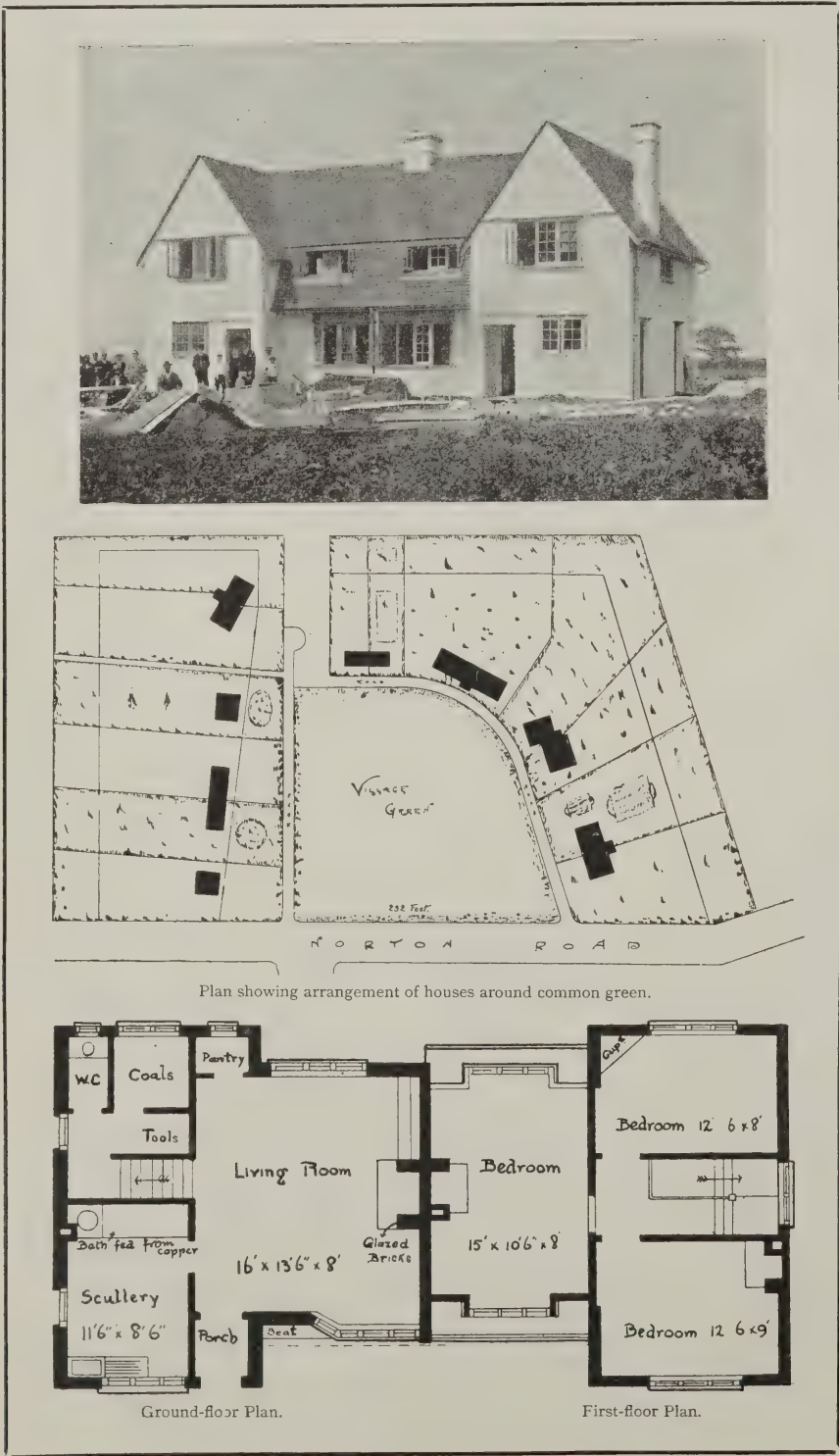
Having now reviewed in detail a representative collection of the cottages, we may give our opinion on the exhibition as a whole. We think that, however successful it may be from the promoters' point of view or in the way of an advertisement for competitors, it must be written down a failure in so far as concerns the solution of the problem of housing the agricultural labourer. It is plain from Mr. J. St. Loe Strachey's first article in the "County Gentleman" suggesting the competition that the type of cottage was intended to be suitable for the agricultural labourer and to cost £150 inclusive. Mr. Strachey calculated that agricultural labourers' wages averaged from 14s. to 16s. per week (12s. is often the case), and therefore £150 was the largest sum that could profitably be spent on the erection of a cottage. We said at the time that 1s. 6d. per week was about all the agricultural labourer could afford to pay. Consequently, to solve the problem a house should be built for £100. The only cottages in the exhibition which approach Mr. Strachey's ideal are those by Mr. Clough, but as this gentleman had already built similar cottages it did not require the exhibition to prove the fact.

A number of the competitors seem to have gone deliberately to work to build cottages which they knew must exceed the limit imposed, simply using the exhibition as a stalking-horse for their own self-advertisement; and from our knowledge of the cost of materials and labour we must think their figures in the catalogue are gross misrepresentations. The conditions of the competition were badly drawn up from the start, because if the cost of the cartage of materials to the site, and fencing, drainage, builder's profit, architect's fees, &c., were not to be included, the sum for which the cottages were to be built should have been very much less than £150, which is the figure at which a cottage such as that desired should be sold.

As regards the planning of the cottages, in the majority of cases this is very bad, the position of the bedstead not having been considered, passages, large landings and nooks sacrificing valuable space; while roofs are often broken up and fittings too elaborate. The designers who prate about art have mostly proved themselves incompetent and impracticable planners, and ignorant of the principles of good construction and hygiene. At the same time there are a number of plans which are fairly good and could be economically built.

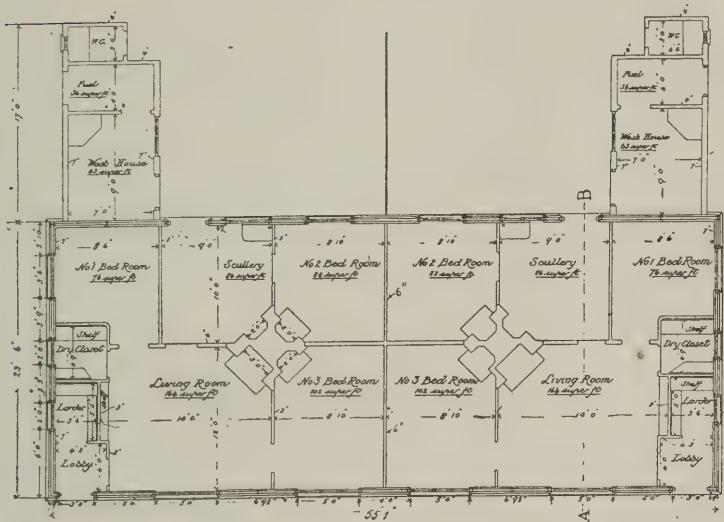
A great deal of nonsense has been said about some of the new materials and methods of construction adopted at this exhibition. In many cases the new materials are more expensive than ordinary brick and plaster, and will remain efficient for but a few years. Concrete has not been utilized in such a way as to make the most of the material, and instead of being cheaper than brick it is as dear, if not dearer, while it is not so satisfactory by reason of the condensation of moisture if not plastered inside.

The exhibition of designs which is also being held adds nothing useful, the plans being duplicated in one or other of the cottages. In conclusion we may say that there are plans in this exhibition which could be erected for the money by means of piece-work labour and economy in fittings. As we have said before, direct employment of labour and the purchase of materials is the crux of the problem. Many of the buildings are still unfinished. The wrong class of people also seem to be visiting the exhibition. They appear to be mostly parsons, week-enders and "simple livers," who go down in shoals seeking the impossible; and we cannot but feel that those competitors who threw discretion to the winds and built prettily and lavishly knew their public best.

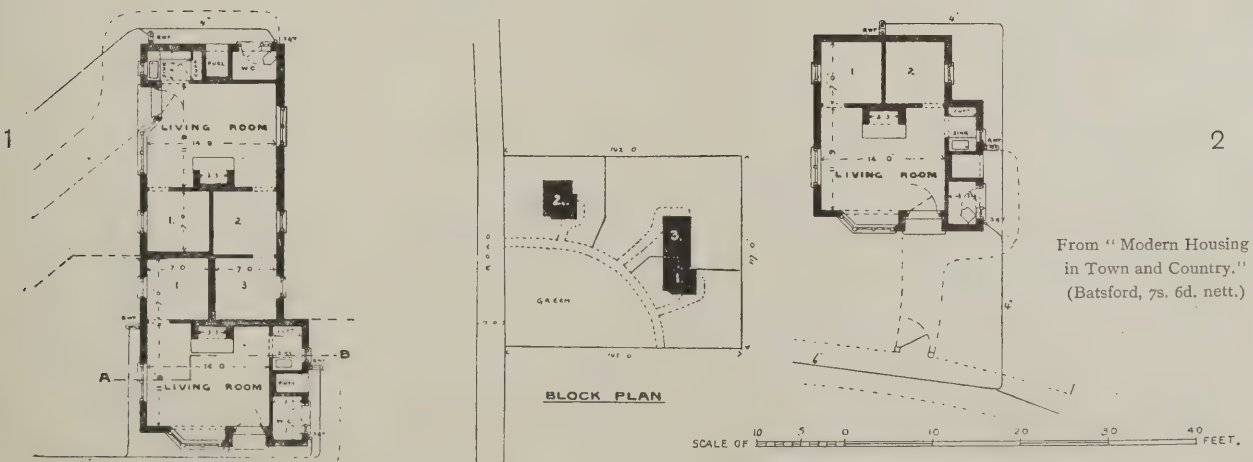
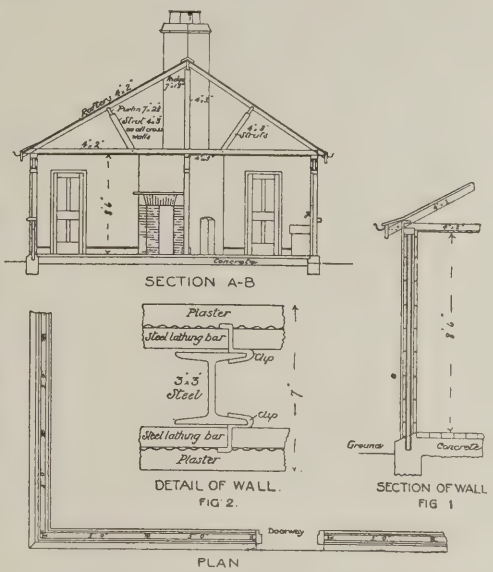




PAIR OF COTTAGES AND SINGLE COTTAGE BY POTTER & CO. (£300 AND £150); COTTAGE BY C. G. AGATE (£140); AND PAIR OF COTTAGES BY CURTIS GREEN (£175).



PLANS, SECTIONS AND DETAILS OF PAIR OF COTTAGES BY POTTER & CO. COST £300.



PAIR OF COTTAGES AND SINGLE COTTAGE BY HENMAN AND COOPER. AVERAGE COST, £100 PER COTTAGE.

From "Modern Housing in Town and Country," (Batsford, 7s. 6d. nett.)

VENTILATING AND HEATING.

By E. G. RIVERS, M.I.C.E.,
Chief Engineer to H.M. Office of Works.

IN a paper on ventilation and heating which he read before the recent London congress of the Royal Institute of Public Health Mr. E. G. Rivers, M.I.C.E., said that the ventilating and heating of places of a domestic type, where the maximum occupation was not excessive, and where open fires were a *sine qua non*, presented no special difficulty in the winter season, while in summer open windows probably afforded the best solution; but with places in which a large number of persons were congregated a very different problem presented itself—one which called primarily for the attention of the engineer, who should be associated with the architect of a new building at the very earliest stage—i.e., when sketch plans were being prepared.

Ventilating and heating arrangements were too often viewed in the same light as the furniture and fittings of a building—in many cases no provisions were made by the architect beyond the inevitable boiler-house and "Tobin tubes" in the larger rooms.

Air Supply.

The supply of air per person per minute was placed by some authorities at 30 cub. ft., while others asserted that as much as 50 cub. ft. was required. Personally he inclined to the opinion that a computation based upon the 30ft. or minimum scale would suffice very well if the air were of good quality.

Absurdities about "Natural" Ventilation.

Now, as to the means by which this change was to be effected. He had often wondered at the credulity of users of certain appliances for the alleged securing of the required change of air in a building on the principle of so-called "natural ventilation." Without much thought, such appliances were piled into building contracts and were expected to do great things in the change direction, but in a good many cases no provision was made for the admission of air to replace that alleged to have been removed. Given a certain wind velocity and means of admitting fresh air, there would probably be an upcast to a certain extent in such appliances, but something totally ineffective for dealing with the change incidental to a considerable occupation. Under winter conditions, with still outer air, there was no upcast, but, on the contrary, a descent of the colder and heavier air into the building.

Mechanical Means only Effective.

The concentration of persons in an enclosed space demanded, therefore, a concentrated supply of air, large in volume but low in velocity, and this could not possibly be effected save by mechanical means. The earliest known application of "fan" circulation of air was seen in the old "skip" beehive, which, but for the never-ceasing whirring of the bees' wings, would probably be a difficult place even for insect-life. In the ventilation of buildings very satisfactory results could be obtained by using fans of suitable type, properly applied, either dealing with the input or the extraction—preferably a combination of both.

Mr. Rivers next considered the cleansing and humidifying of the incoming air, "cleansing" being understood to mean the removal of free carbon and other mechanical impurities chiefly.

Position of Intake.

In all properly-designed systems there must be a main air-intake for winter work, and the best position for this was near the ground-level—just sufficiently protected by a low wall from the entry of heavy impurities. From this point the incoming air should be taken into the screen chamber, steam coils being placed between the point of air entry

and the screen to guard against the freezing of the washing water in winter-time. The input fan should be placed some distance away from the screen, through which the emulsion of air and water was first drawn, and then propelled into the main airways for heating and distribution.

The Washing-screen,

being a very important factor in the case, required special consideration. Mr. Rivers mentioned that, in connection with the proceedings of the last Select Committee appointed to enquire into certain matters affecting the ventilation of the House of Commons, he carefully considered the efficiency of the few types of washing-screens then in use, and arrived at the conclusion that no type was wholly satisfactory. It appeared to him that the points in connection with a washing-screen might be classified as follows:—

(1) The materials of construction should not be decaying.

(2) The impurities removed from the air should not be retained upon the screen.

(3) The interstices should not allow of the passing of untreated air.

(4) The consumption of water should not be excessive.

In this connection he described the type of washing-screen which he recommended to the Select Committee on the ventilation of the House of Commons, and which had been adopted with very satisfactory results.

The whole area of the screen was constructed of copper-wire gauze of a mesh of 400 to the square inch. This was fixed in the form of removable panels to iron frames, the whole being vertically rigid. The water application occurred on the inlet side of the screen in the form of impingement jets without any moving parts; the resulting spray covered the whole area, and the combined air and water was drawn through the screen by the "gauge" exerted by the fan. The large number of mesh divisions to the square inch held "water lenses" or films, which were being continually formed and broken by the passing air and water. Although a certain percentage of water passed through the screen, there still remained sufficient to wash off any particles which might be caught by impingement upon the wire gauze. The quantity of water used was not large, and none was wasted—it passed into a small tank, from which it was automatically pumped to the steam boilers.

Warming and Distribution.

The next point which called for attention was the warming and distribution of the incoming air. Here one approached the controversial, there being strenuous advocates of a centralized heating battery for the whole building, from which warm air was sent by the fan to the distributing flues, while others preferred to divide the heating units and to place them close to the points of delivery to the rooms. The alleged advantage of

The Initial Heating Battery System

did not appeal to him, for the following reasons:—It was necessary under this system to have either a battery with a very high temperature upon the elements, which were often inaccessible for proper cleaning or repairs, or else one of very large superficial area. If the former were adopted, the air was likely to be devitalized from overheating, but in this sense the latter was not so objectionable, though a serious loss of thermal units occurred in both cases in the main and distributing flues. (In all systems of flue-distribution, whether of hot or cold air, it was necessary that the flues be constructed of glazed brick and with ready access for cleaning.)

The question of the velocity of the air passing over the battery was one of vital importance. This was a rock upon which many people came to grief, and the height of absurdity seemed to be reached when we

heard of such things as "high-velocity plenum." In such a system the high temperature of the steam units in the battery was speedily lowered on the side of the elements facing the incoming air, and the whole approached the condition of an air condenser. The passing air was not allowed sufficient time of contact to pick up the thermal units, and the arrangement was therefore inefficient and wasteful.

The question of velocities was one to which engineers should devote more attention, and they should keep in mind the intimate relations of cause and effect as applied to these principles. It would be found that the effective collecting of thermal units from a heating surface demanded a low velocity comprised within a very limited range, and he ventured to think that this reason alone went a good way towards the condemnation of the initial heating battery system.

As the result of many years' experience and study of the subject, he inclined to the opinion that

The most Economical and Efficient Arrangement

should include the following points:—With the air-intake and washing-screen arranged as before described, the input fan would send fresh air into horizontal airways of sufficient size—say, in the basement of a building—and from these controllable distributing flues would be taken up in the main walls to radiator positions in the rooms to be warmed. In this arrangement the main airways received the maximum velocity of the fan discharge—this being subsequently lowered in the distributing flues. The ventilating radiators would take their inlet-air from these flues, imparting the thermal units at a low velocity. To counteract the chill arising from glass surfaces exposed to the outer air, radiator positions should preferably occur under windows, and under this arrangement warmed fresh air would enter at a low level.

They had next to consider

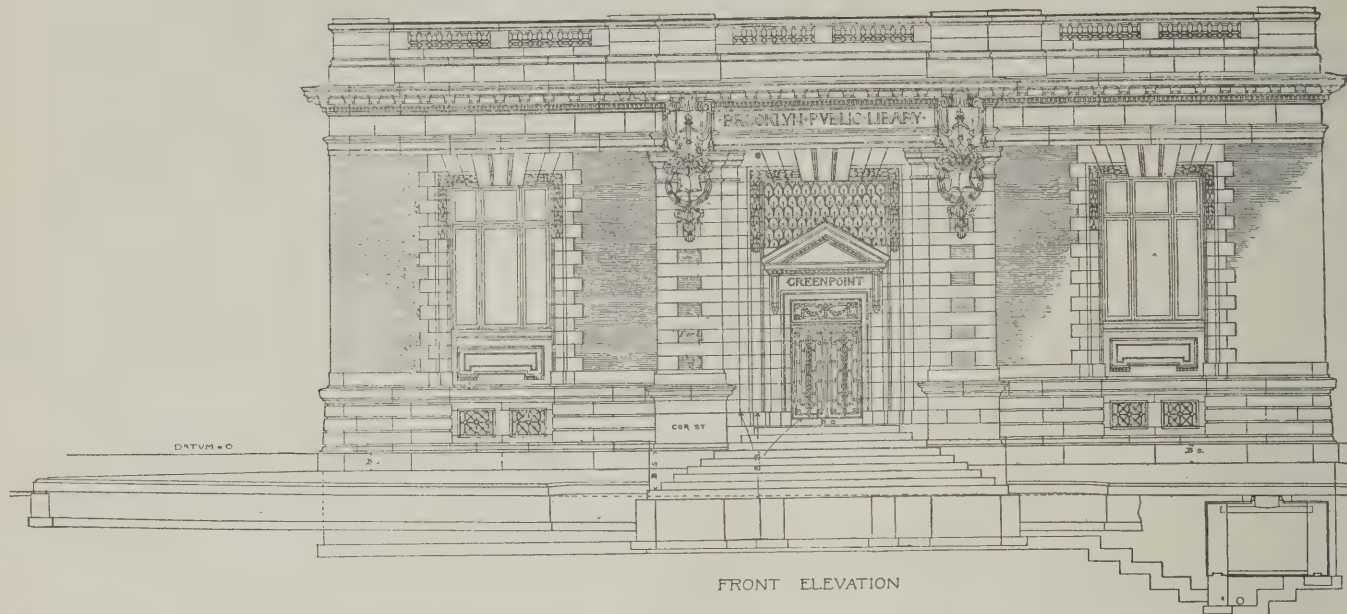
The Direction of the Supply

in order to ensure an efficient change of air in a room. Taking open-air conditions as a guide, it would be found that air-currents took a horizontal direction, coupled with a tendency to rise slightly from contact with the warm earth in the summer season—of course, at low velocities. When velocities were high the tendency to rise practically disappeared. Fresh air being admitted low down on one side of a room, the direction of the flow should be across the room, and the extraction apertures should be at two levels—one at the same height as the point of entry and one at the ceiling-line—both communicating with the same extraction flue.

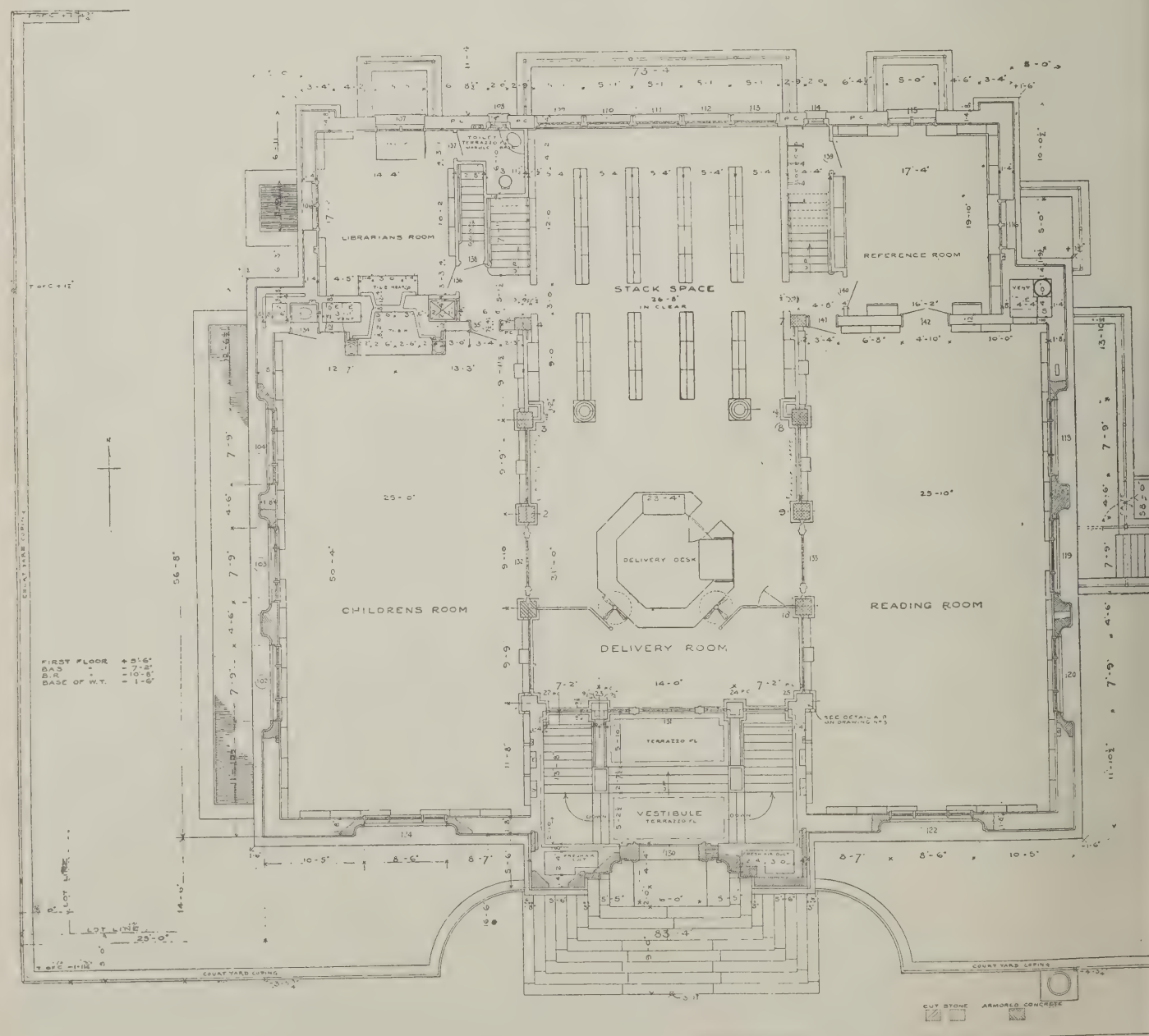
Downward Plenum System.

Hitherto he had dealt with the horizontal system of air-change, which he considered to be the best suited to the majority of cases, when such a system could be applied, but for theatres and other similar places of public assembly there was no valid objection to the downward plenum system, coupled with ultimate upward extraction *via* flues in the main walls. In this case the ultimate outlet for the vitiated air needed to be carried well above and away from the inlet, unless the latter were first taken from below. The ancient idea that extraction must necessarily be upward, because heated air rose, was to be dismissed from their minds. What we had to keep in view in the case of a theatre was the periodic change of the air without draught to the audience and irrespective of direction. The air admission in the downward plenum system should be over as large an area as possible and at a low velocity; therefore in the construction of a new building this could be best effected by the interposition of a separate roof-space as an equalizing chamber. The inconvenience and danger of "streak" ventilation by the injudicious use of fans also needed to be taken into account.

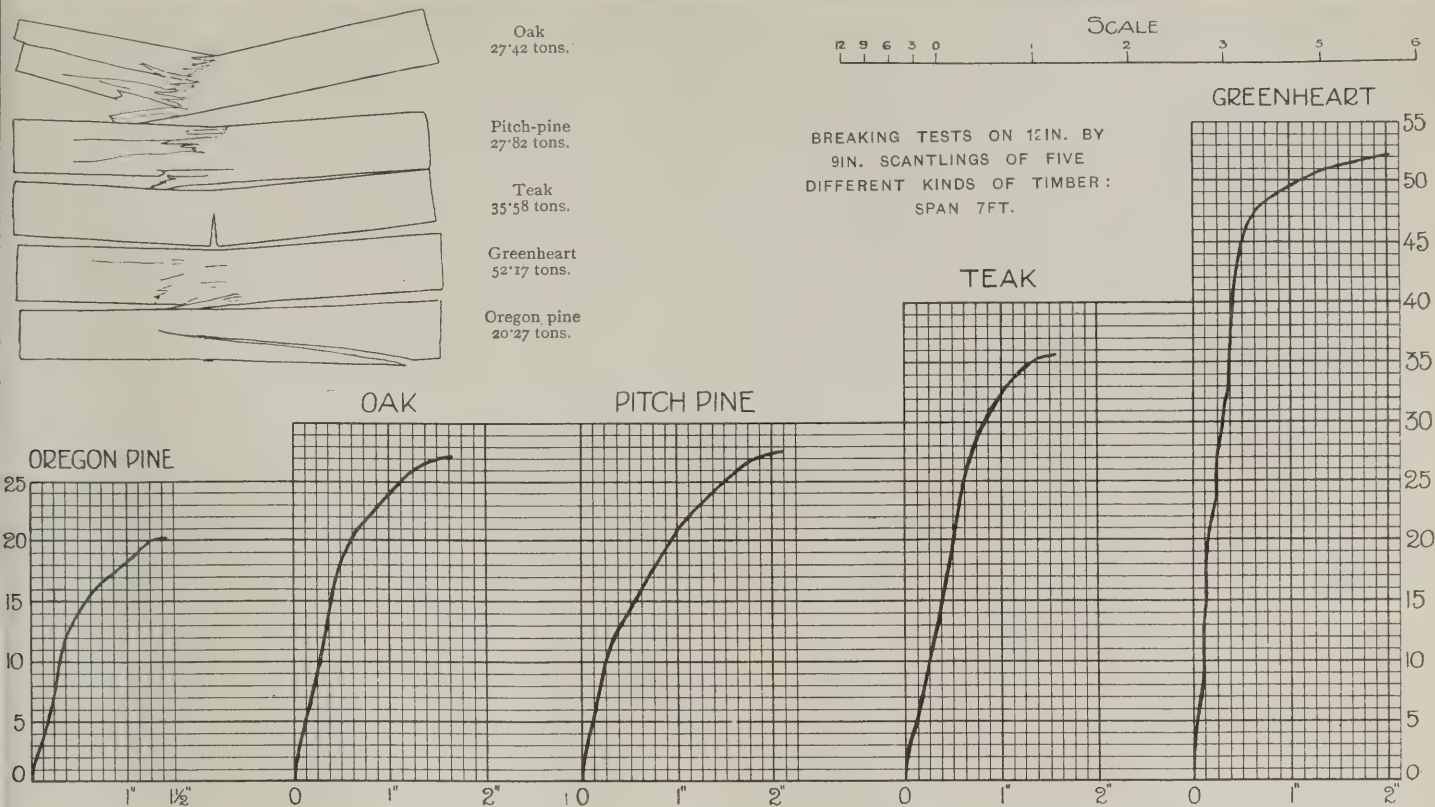
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TESTS ON TIMBER SCANTLINGS.

THE accompanying diagram showing the results of some timber tests carried out in the engineering department at Bradford Technical College has been redrawn from one given by Mr. John W. Overend in a recent number of the Journal of the Incorporated British Institute of Certified Carpenters. The tests, it will be seen, were carried out on scantlings of Oregon pine (from British Columbia), English oak (from Yorkshire), American pitch-pine (from Florida), teak (from British Burma), and greenheart (from British Guiana). The scantlings were 12ins. deep by 9ins. wide over a span of 7ft. with vertical supports. The results of the tests may be tabulated as follows:—

	Breaking Weight in Centre.	Constant or Modulus of Rupture for Beam 1in. wide, 1in. deep and 1ft. long.	
		By Experiment.	As given by Sir J. Anderson.
Oregon pine	20'27	245	—
Oak	27'42	331	557
Pitch-pine	27'82	336	544
Teak	35'58	430	820
Greenheart	52'17	626	—

The constant or modulus of rupture by cross-breaking is calculated by the formula $c = \frac{BW \times L}{b \times d^2}$, where BW = central breaking weight in lbs. by experiment, L = length or span in feet, b = breadth of beam in inches, and d = depth of beam in inches. The breaking weight of any other beam may then be found by the equation, $BW = \frac{b \times d^2 \times c}{L}$.

Birmingham Town Hall is in process of alteration. The work, which was begun in May, has involved the reconstruction of the orchestra, the improvement of the existing exits and the provision of others, as well as the provision of proper sanitary arrangements. Mr. F. Martin (of the firm of Martin & Martin) prepared the plans. The cost is estimated at £6,000.

Correspondence.

A Recreation Club for Architectural Students.

To the Editor of THE BUILDERS' JOURNAL.
SIR,—I think Mr. Gordon's idea for a recreation club should not be shelved without a good try to set it going. There are many students already playing tennis, football, &c., for different clubs, but a great number do not play because they cannot find a suitable club. I trust you will take this matter up.—Yours truly,

J. ARCHIBALD WILSON.

BAYSWATER.

[It is quite outside our province to start any such club as that suggested, but, as already stated, we shall be happy to lend space in bringing students together so that the actual arrangements can be carried out by them.—Ed. B. J.]

Plougasnou Church and its Cresset Stone.

To the Editor of THE BUILDERS' JOURNAL.
SIR,—Happening quite recently to have been at Plougasnou, "C. A. N.'s" excellently illustrated paper on its church, in your issue for July 19th, has been perused by me with exceptional interest. Therein the author refers to "an altar-like slab of stone, with a square sinking in the middle . . . apparently designed for a 'cresset stone,' or else for some kind of credence for offerings." One so seldom comes across any reference to cresset stones that this passing mention is of value, and I blame myself for carelessness in not noticing the stone in question when actually upon the spot. "C. A. N.'s" remark, "designed for a cresset stone," does not leave it quite clear whether he means it is a cresset stone or a receptacle for a cresset stone to fit into. Of course, all cresset stones I have ever examined—and they are many—contain one or more circular cup-like cavities upon the upper face. The word "cresset" is the Middle English word for a cup containing a light, and comes to us from the old French *cresset*, a cresset, as well as from the old Dutch *kruyse*, a cup or pot.

We have many instances of cresset stones in England—that at Lewanwick Church,

in north-east Cornwall (much like a font and containing seven cup-like sinkings) being, perhaps, the best. Other interesting examples may be seen at Calder and Furness abbeys, Carlisle Cathedral, Wool Church (Dorset), St. Mary's Monmouth, St. Mary's Abbey York, Durham Cathedral, Llanthony Abbey (Wales), &c. I have also seen four ancient specimens in the Stockholm Museum, and yet another at Strio, in the diocese of Sund. At the latter place there is also preserved one which was formerly in Nöbbelop Church, in the same country. In Sweden these are known as *vigvattens-sten* (holy-water vessels), but they are, without a doubt, really cresset stones.

If "C. A. N." is correctly read—that the cavity at Plougasnou is square on plan—then I doubt whether it is a cresset stone at all, as the cups in the latter are invariably round.

The actual use of cressets is very clearly explained in the "Rites of the Church and Monastery of Durham": "There is standing in the south pillar of the Quire doore of the Lanthorne, in a corner of the same pillar, a foure-squared stonn, which hath been finely wrought in every square, a large fine image, whereon did stand a foure-squared stonn above that, which had twelve cressets wrought in that stonn, which was filled with tallow, and every night one of them was lighted, when the day was gone, and did burne to give light to the monkes at midnight when they came to mattens." And again those in the dormitory are described: "In either end of the same dortor was a four square stone, wherein was a dozen cressetts wrought in either stone, being ever filled and supplied by the cooke as they needed to give light to the monkes and novices, when they rose to their mattens at midnight, and for their other necessary uses."—Yours truly,

EXETER.

HARRY HEMS.

A Suggested Street Improvement.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The articles in your Journal on the suggested improvement of Oxford Street near the Marble Arch have much interested me. For long I have wondered why an improve-

ment of this corner and of Park Lane has never been mooted. My own idea is of a highway in continuation of Edgware Road, along Park Lane, across Buckingham Palace grounds into Vauxhall Bridge Road, over the bridge and to Camberwell Road near the Oval. Such a road would be of the greatest possible utility in facilitating the inter-communication between south and north-west London, now so sorely needed. The congested Marble Arch intersection would be relieved, the valuable residences of Tyburnia opened up to most convenient access from clubland, while the Arch itself would stand out as a feature of the scheme much as suggested by Mr. Speight. Unluckily the scheme falls foul of the Buckingham Palace grounds, but perhaps some readjustment of areas might be found which would put the scheme within the limits of practicability. At the worst, the road might go across Green Park along the front of the Palace and thence direct to Vauxhall Bridge.—Yours truly, F.S.I., A.M.I.C.E.

Expansion of Concrete Floors.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The question about concrete floors asked by "C. W." on p. 24 of your issue for July 12th opens out a subject of general interest, and the answer given does not, I think, cover the whole interrogation.

Did the querist put the sample of concrete into the bottle at the same time as the concrete floor was laid, or did he only apply the bottle test after the floors had expanded, and was the sand test made at the same time or otherwise?

My own experience is somewhat large. At one time, by seeing to fine grinding and efficient aëration of the Portland cement, I had prevented the coke-breeze concrete expanding. Now we find that expansion is not prevented, but deferred to three to eighteen months after the floor concrete is in position. This alteration of behaviour coincides with the alteration in the manufacture of the cement, by which 2 per cent. of gypsum (sulphate of lime or plaster) has been added either before burning or at time of grinding—I do not know which. Users so constantly demanded a slow-setting cement that this gypsum is now successfully added to give it that quality without the trouble and expense of finer grinding and aëration. Now, the expansion takes place at a time much more convenient to builder and cement manufacturer, viz., when both have been paid.

I have raised the question several times in the professional press and at meetings of societies where papers on cement have been read, but have not succeeded in ascertaining whether the co-incident alteration in the cement manufacture and the deferred expansion of the concrete are respectively cause and effect. The question appears to be persistently shirked.

Is the delayed expansion caused by the chemical reactions between the other ingredients of the cement or matrix? Would the gypsum (sulphate of lime) react on the sulphur in the coke to the detriment of the concrete? We architects cannot be expected to be expert chemists in determining these abstruse questions; we can only observe and report as alterations in manufacture occur, and occur without any consultation with architects and engineers, as users.

The gentleman who answered the question says it is usual to leave a space around the walls until all expansion has stopped. But I remember reading in your columns a discussion of the members of a builders' institute in which highly experienced builders of great reputation deprecated this expedient, and in any case it is highly inconvenient where the expansion, as is now the case, is deferred for so long a time after the work is done.

It must also be remembered that in the

case of long concrete floors with transverse steel joists the precaution last referred to is quite useless in endway expansion, as no space can be left between joist and concrete, and the joist ends at their bearings communicate the expansion force to the walls.

The suggestion that the concrete was over-limed appears to be futile in view of the querist's information that although the furnace ash concrete in his experiment burst the bottle, yet the same cement mixed with Leighton Buzzard sand had no such effect. If over-liming was the efficient cause of the expansion one would expect it to have survived so as to have expanded both samples.—Yours truly, A. H.

LONDON.

"A. H.'s" letter is interesting, and perhaps other correspondents can throw a light on the subject. In the particular case at issue there is very little to discuss which is tangible. There are so many possibilities that it would require much experimenting and careful observation to discover the real causes of the effect. Expansion of concrete is usually due to over-liming, and our reply was in general terms. In the second experiment our correspondent made with the sand the cement might have been more aërated, and thus free lime might have been neutralized, but as the bottle was filled at the same time as the one with furnace ashes aggregate, this does not appear to have been the case. Another point touched on in our reply was whether the floors were allowed to set in air or kept wet. It seems very probable that the mischief was caused by the iron clinkers and sulphur deleteriously acting on the cement, as often happens with iron slag. As regards "A. H.'s" contention that gypsum may cause expansion, we think this doubtful. For one thing the proportion is small. Whatever chemical action was going to take place could hardly occupy months in developing when both materials are finely ground and have water present to assist combination. "A. H.," in referring to a discussion reported in this Journal, probably means that at the Royal Institute of British Architects, when papers on reinforced concrete were read by Mr. Mouchel and Mr. Dunn, but then the speakers took special precautions with the cement and the concrete to avoid trouble, as it was not possible to adopt the usual expedient. With regard to an ordinary steel joist floor, the distance between the joists is so small that the expansion is little and can be taken up by the joists; but there is a greater extent of concrete parallel to the joists, and it is wise to leave a space around the walls that way.—ED. B. J.]

Cheap Cottages Exhibition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Referring to the article on the Cheap Cottages Exhibition in your issue for last week, I notice that you say the cost of the pair of cottages I have built at Norton is "put" at £400. It may interest you to know that these cottages were not built with a view to competition. The work was a commission and £400 was the contract sum, and as such includes all the usual things—builder's profit, carriage, &c., complete—also a barn building 14ft. by 10ft. inside which you do not mention. Nor was the price competitive, as I was so pleased with the contractor's work on another job that I asked him to give me a price for this without competition. You will thus see that, deducting the items allowed by the committee, the price per cottage would be well under £200—something like £170 to £180 or less. The same remarks apply to the cottages I built for the First Garden City, Ltd. The prices in the exhibition catalogue are from the accounts as settled, and include builder's profits, carriage, &c. I do not think there is any scamped work in these cottages, and it is only fair to state that the builders for

both commissions were Messrs. Raban & Sons, of Baldock, Herts. The cottages were only entered because they were found eligible for competition.—Yours truly,

LONDON.

GEOFFRY LUCAS.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—It was certainly desirable that the public's attention should be called to the discrepancy between the real and stated cost of the cottages at Letchworth. But you have let go the chief offenders and tarred all parties with the same brush. For instance, there is nothing to complain about in the stated prices of Mr. Geoffry Lucas's cottages or of Mr. Troup's, both admirable and probably erected for just about the sums named; but compare Mr. Lucas's with Mr. Baillie Scott's. The difference in (stated) cost is only £20. Yet in Mr. Baillie Scott's, unless I am mistaken, there are nearly half as many more cubic feet, the materials are of the most expensive kind—old tiles, lead-lights filled with crown glass, elm doors with purpose-made wrought iron-work, elm dressers and seats, half-timber work, rough-cast, and not the slightest attempt in any direction at economy. Note the large amount of brickwork in proportion to space enclosed, the huge proportion of roof—scullery, coals, &c., being only one storey high; the work in dormers, lead flashing, &c., and a large part of the chimney projecting from the roof—this chimney has fourteen angles, all rough-cast. Note also the expensive paving to porch and front entrance. It really is an insult to the credulity of the profession to state that these cottages only cost £420: £700 or £1,000 is a great deal nearer the mark. I work out the Concrete Machinery Co.'s cottage at 3d. per ft. cube. It would be interesting to know how this saving is effected. I suggest that they should submit a bill of priced quantities for publication.—Yours truly,

X.

OUR PLATES.

FOLLOWING our practice of giving from time to time representative examples of modern work abroad, we illustrate this week another American library—the Greenpoint branch of the Brooklyn Public Library. American architects have excelled in the monumental treatment of their libraries, having been taught this by the French, and the present example is a very good one. The exterior and interior are well-proportioned and the plan is symmetrical and open. It will be noticed what a large room (50ft. by 25ft.) is provided for children, this feature being especially prominent in American libraries and one which has found its way over here. The arrangement of the book stacks and delivery desk is also interesting in comparison with English practice.

Builders' Notes.

Messrs. Joseph Kaye & Sons, Ltd., of Leeds and London, have received an order from the Admiralty for 4,700 of their new patent serrated seamless oil-feeders.

The Aberdeen Quarries are feeling the depression in the local building industry. At one quarry there is stated to be already an accumulation of stone for which there is no demand. Several of the quarries are devoted largely to the production of stone for manufacture into setts. There are one or two big building jobs yet to be finished in Aberdeen, and for some time this will keep up the demand at the quarries which have the orders in hand, but when these are completed it does not appear that the outlook will be at all bright.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Seating of a Public Building.

HERNE HILL.—V. H. H. writes: "Please state the London County Council regulations as to the number of chairs allowed to be fixed together in a public building and the distance apart each way."

The regulations of the London County Council as to gangways in public buildings state that "a clear passage . . . not less than 2 ft. wide shall be formed at the sides and in the rear of the seating in every part of such premises. Such passages or gangways shall at all times be kept entirely free from chairs, flap seats or other obstructions, whether permanent or temporary." I am not aware of any regulation as to the points on which you particularly ask for information. It is, however, usual to allow 2 ft. 6 ins. from back to back of the seats and about 1 ft. 8 ins. in length for each person. An ordinary chair occupies a width of about 1 ft. 4 ins.

F. S. I.

Building in China.

ROTHESAY.—ROTHESAY writes: "Having been asked to prepare plans of a house to be erected in China, I should be glad to know whether there are any books published giving information about the methods of building in that country, and if plans should be drawn to British or metric scales."

We do not know of any book giving information as to the building laws or methods of building in China. Possibly the Embassy might be able to inform you.

Cotton Spinning Mills.

SUBSCRIBER writes: "Please name one or two books on the construction of large cotton spinning mills similar to those erected in the manufacturing districts outside Manchester."

We are not aware of any book dealing with the construction of large cotton spinning mills. There are books on the construction of the machinery, such as Nasmyth's "Modern Cotton Spinning Machinery" (Manchester, 1890), but apparently nothing on the arrangement and construction of the mills.

Cracks in Factory Walls.

FACTORY writes: "The new building shown by sketch (not reproduced) is used for the manufacture of mastic compositions. About three months ago an explosion occurred, disturbing the brickwork of the boiler-house and starting the skewbacks of the arches at the end of the building. This damage was repaired. About one month ago cracks appeared above the window arches, mostly following the jointing of the brickwork; the rings of the arch over the door parted and are very gradually lengthening. I do not think this is due to settlement, as the foundation is good firm clay, but I have been told that the heat from the pitch boilers caused the work to expand, and not being able to contract again it cracked; this being probably assisted by the chemical action of the fumes of sulphur. What is your opinion?"

The cracks indicated may, as suggested, have been due to the explosion, but those that have recently developed are in all probability due to the building being on clay. The pitch boilers appear to be at some

distance from these cracks, but even if they were close the clay would be the more likely element of disturbance. It is not safe to build upon clay unless hoop-iron bond is built in the footings or other means are taken to hold the work together. However hard the clay may appear to be, it is always on the move with changes in the weather, and no building erected upon it is safe from cracks unless specially designed. The writer has had numerous cases put before him at various times which were only explainable on this hypothesis. If the ground is on the slope of a hill the action is intensified.

HENRY ADAMS.

Roof of Two Pitches.

ROCHDALE.—W. T. D. writes: "To find the length of hip rafters when the slope of the roof is 60 degs. and hip rafters 30 degs. How can this be determined?"

Let AB (Fig. 1) represent the span of roof. From A and B set up angles of 60 degs. to intersect in point C; then DC will be the vertical height from eaves to ridge. Next select any point on the ridge, as E (Fig. 2), and at any angle set up EF equal to DC; also from EF set out lines EG at right angles and FG at 60 degs., meeting at the required angle of 30 degs. in point G; then FG is the true

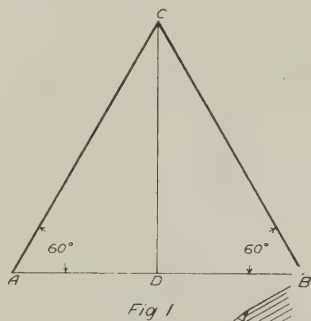


Fig 1

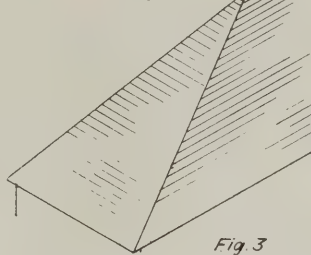


Fig 3

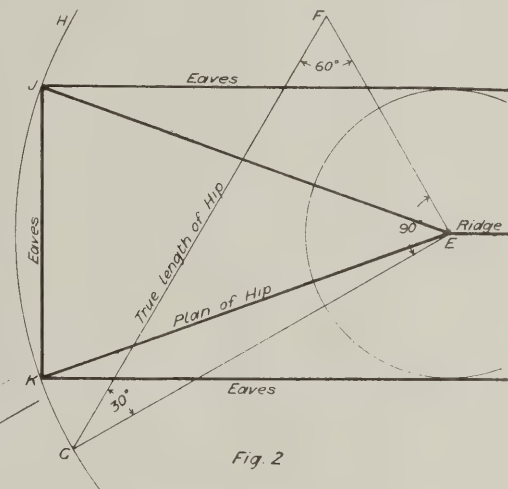


Fig 2

ROOF OF TWO PITCHES.

length of hip rafter. Now with a radius of half span = AD swing an arc with centre at E; then lines parallel with ridge and tangent to the arc will give the lines of eaves, which should be produced indefinitely. Next, with centre E and radius EG swing the arc GH and produce the eaves lines until they intersect the arc in points J and K. Join JK, JE and KE, and the plan (Fig. 2) is complete. Fig. 3 shows an isometric sketch of the hipped end of roof, from which it will be seen that the result would be very unsightly; in fact, the enquiry reads like an ill-considered examination question.

HENRY ADAMS.

Black Paint for Drawing-board.

WINCHESTER.—X. writes: "Please name a paint or chemical for applying to a drawing-board so as to make it like a blackboard so used in schools, &c."

A number of paint firms make a black-board wash, and to purchase from them saves much trouble.

Bats in a Church.

LONDON.—FLITTER-MOUSE writes: "I was told recently that I had brought the architectural profession into disrepute by being unable to advise a vicar as to how he might get rid of bats in his church, which cause great inconvenience and labour by fouling everything. Stopping up the places at which

they enter is quite impracticable, and my friend's intention of burning sulphur candles appeared to me to be unlikely to produce any permanent benefit. Presumably a poison would only be effective while it remained, and it would entail a heavy task on the sexton. I shall be glad of any suggestions as to how to meet the difficulty, which must be fairly common."

It is probable that if the church were used more frequently the bats would desert it! The remedy will certainly require the exercise of patience, but I know of nothing better than that the bats should be caught during the daytime, when they will be found clinging to the walls above the places where their droppings are found to be a nuisance. I do not think the other plans you mention will be of any use. F. S. I.

Finish for Oak Floors.

WOODFORD.—H. G. writes: "Which is the best way to treat newly-laid oak floors without polishing them? Is linseed oil and beeswax rubbed in hot the best foundation, afterwards rubbing from time to time with the oil?"

Linseed oil for a first coat, and afterwards, and from time to time, rubbing with beeswax and turpentine.

Musty Smell in Rooms.

KILDARE.—L. T. writes: "Having erected an hotel here, we found after a few months that a fibrous plaster cornice opened up at the joints. It was repaired with oil putty. The rooms where the repairs were done now have a musty smell. Would this be due to the repairs?"

Oil putty would not cause a musty smell. It must be due to some other cause.

Architect's Fees on Joinery Work.

LONDON.—ARCHITECT writes: "Some clients of mine, who are the lessees of a large ground-floor shop, recently fitted it up as a showroom and offices. The lessors (who are builders) made a private arrangement with the lessees that they, the lessors, should erect all the partitions, showcases, shelving, &c., free of charge. The drawings for this joinery work were prepared by me, and firms were requested to tender for making and delivering the fittings only. The lessors tendered, but another firm put in a lower price and obtained the work. I superintended the construction and also supervised the lessors during erection. I have sent my clients a statement of my fees and have charged a commission on the certificate sent to the builders who made the fittings. I have also ascertained from the lessors how much the work cost them to erect, and have charged a commission on this. My clients

state that I am not entitled to charge commission on work executed free of charge. Although I agreed to accept a commission on the cost of the work, I fail to see that if the lessors execute work for nothing (probably in order to obtain the rental asked) I should not be entitled to my fees for superintending. I shall be glad of your opinion on the matter."

We certainly think that you are entitled to the commission you have charged.

Keystones.

Extensive Additions to the Y.M.C.A. Institute at Leslie are to be made from plans by Mr. Peter L. Henderson, of Edinburgh.

A new Fire-station at Knightsbridge, at the junction of Hooper's Court and Basil Street, is to be built by the London County Council at a cost of £14,600.

The Bridge in the High Street, Tunbridge Wells, is to be rebuilt at a cost of £14,000. It crosses the line of the South-Eastern Railway, and the company have consented to bear one-third of the cost.

A Roman Pavement at Dorchester which is believed to be one of the most perfect examples of ancient Roman mosaic flooring was found recently. It is to be taken up and relaid in the Dorset County Museum.

New Buildings in Nottingham for the Industrial Institution for the Blind are nearing completion. Erected in two blocks, each three storeys high, the total cost, including furnishing and equipment, will be about £12,000.

A new Police- and Fire-station at Windsor is being erected. The buildings will include a police-court, chief constable's residence, inspectors' and sergeants' offices, quarters and recreation-room for single constables, drill-room and fire-station. The total cost is placed at £16,000.

The Chancel of Starcross Church has been altered and re-decorated from plans prepared by Mr. C. J. Tait, A.R.I.B.A., of 6, Staple Inn, London. The altar, altar rails and flooring were all removed and replaced with new carved altar and altar rails, and the chancel laid with Connemara marble. The decoration of the walls was carried out by Messrs. F. Drake & Sons, of Exeter.

The Waterloo Bridge Lamps.—At last week's meeting the London County Council adopted the recommendation of the Bridges Committee to replace the original bronze lamp standards on Waterloo Bridge, for which the present electric-light standards were substituted a short time ago. The electric light is to be discarded and incandescent gas adopted, as it is estimated to be cheaper.

A Florentine Palace.—The stately old Palazzo dell' Arte della Lana behind the church of Or San Michele at Florence (which had long been falling into disrepair, while many of its most interesting features, especially in the interior, were hidden under additions of a later age) has now, owing to the munificence of a millionaire, been purchased from the municipality by the Italian Dante Society and carefully restored by Prof. Enrico Lusini.

St. Gregory's, Norwich, is being restored. It was founded in 1210, rebuilt in 1394, and is unique in that "city of churches" by reason of its Galilee porch, sanctuary knocker and because it is the only church besides the cathedral which anciently had a spire. The sanctuary knocker was fixed upon the south door and is of fourteenth-century work. The general design is a lion's head, from the jaws of which issues a human face. The ring has disappeared, and the scutcheon was removed for safety to the interior and is now fixed on the vestry door.

Permanent Asylum Buildings at Banstead are to be erected in place of the temporary buildings, at a cost of £30,763.

A Public Hall at Darnall, Sheffield, was opened recently. The architect was Mr. A. E. Turnell and the contractor Mr. George Carr.

Embankment and Over-bridge Trams.—In the next session of Parliament the L.C.C. Bill for the construction of tramways over Blackfriars and Waterloo Bridges and along the Embankment, which was recently rejected by the House of Lords, will be reintroduced.

The Tower of Upton Church, Slough, one of the oldest and most famous in the country, is about to undergo repair, and the opportunity is to be taken to remove the "extinguisher" roof, which is not part of the original Norman design.

A.A. Day School.—The 1905-06 syllabus for the day and evening continuation schools of the Architectural Association has just been issued. The winter term commences on September 25th. Drawings prepared in the day school may be submitted in lieu of testimonies of study for the R.I.B.A. intermediate examination, and it is now proposed that students who have completed the four years' course shall be exempted from this examination.

Royal Blind Asylum and School, Edinburgh.—Great improvements are to be made in connection with this institution. Mr. J. Macintyre Henry, of Edinburgh, is submitting plans to the committee. The principal features are the addition of another storey to the Craigmillar Institution, the modernizing of the sanitary arrangements, and the improvement of the workrooms at Nicolson Street. The total cost will probably amount to £20,000.

The Rebuilding of St. Mark's Campanile, Venice, is being regularly proceeded with. The work has now reached the level of the ground, and the engineers hope to get several metres up during the autumn. The foundation has been very carefully and solidly extended considerably beyond the limits of the old one. The difficulty of dovetailing the new work with the old has been the principal cause of the delay. But this has been most admirably accomplished, and it is hoped now to get ahead with the above ground shaft more quickly than was expected. Nearly all the pieces of the Loggetta have been found and can be put together.

Competitions.

New Town Hall, Dartmouth.—In the conditions of the competition for a new town hall, municipal offices, market and other buildings proposed to be erected on the site of the existing market at Dartmouth, the town council reserve to themselves the right to select what they consider to be the best designs, though they speak of "calling in such expert advice as they may consider necessary to assist them in making such selection": moreover, they reserve "the right to use the whole or part of either of the successful designs, or to cause plans to be prepared embodying ideas that may be contained in either or all of such designs, if in the opinion of the Council it is desirable to do so." These conditions are unsatisfactory and unfair, and should be taken into account by intending competitors. Three premiums are offered, respectively £50, £30 and £20, and designs are to be submitted by September 23rd.



COTTAGE HOMES OF THE FURNITURE TRADES' BENEVOLENT ASSOCIATION AT RADLETT
R. FRANK ATKINSON, F.R.I.B.A., ARCHITECT.

FURNITURE TRADES' COTTAGE HOMES.

WE illustrate above the first two cottage homes of the Furnishing Trades' Benevolent Association at Radlett, a pretty Hertfordshire village about fifteen miles from London. Under the direction of Mr. R. Frank Atkinson, F.R.I.B.A., these homes have been transformed out of four cottages and were recently opened by Mr. S. J. Waring, junior, the president of the Association. They are for the benefit of the children of the necessitous widows of trade subscribers to the Association, and are regarded as the nucleus of a future colony conducted on the same philanthropic and benevolent lines. One of the homes is for twelve boys and the other for twelve girls. Each will be under the charge of an experienced matron.



MR. S. J. WARING, JR.

EFFLORESCENCE ON CONCRETE.

THE white efflorescence which comes out on the surface of walls newly plastered with cement or constructed of cement-concrete is undoubtedly an eyesore, and is a constant source of trouble, as it takes a considerable time to wear off and is expensive to remove. Some recent investigations on the subject have been conducted by Mr. Beaumont Jarvis, of Toronto, Canada, which are valuable. The experimenter tried to get rid of the efflorescence on the face of concrete building blocks by washing the cement before mixing it with the aggregate. As the components of efflorescence are obviously soluble, this seemed a feasible way to separate them from the cement. In order to test the effectiveness of the method of procedure and also to find out how the strength of the cement was affected by it, he put the matter in the hands of Mr. J. C. Johnston, analyst for the Municipality of Toronto, who reported as follows:—

Analysis of the Cement.
Throughout the entire tests Alsen's German Portland cement has been used. This cement has the following chemical analysis:—

Silica	-	-	-	-	-	Per cent.
Alumina	}	-	-	-	-	22.44
Iron oxide	}	-	-	-	-	8.95
Lime	-	-	-	-	-	61.44
Magnesia	-	-	-	-	-	2.45
Anhydrous sulphuric acid	-	-	-	-	-	1.17
Alkalies	-	-	-	-	-	0.82
Carbon dioxide	-	-	-	-	-	1.45
						98.72

A physical test of the cement resulted as follows:—

Specific gravity	-	-	-	-	-	3.09
Fineness, residue on No. 100 sieve, per cent.	-	-	-	-	-	8.50
Hot test—sound (i.e., no free lime in the cement).	-	-	-	-	-	
Setting, initial	-	-	-	-	-	175 minutes.
„ final	-	-	-	-	-	355 „

Tensile Strength.		
	Neat.	3 Sand to 1 Cement.
24 hours	277 lbs. per sq. in.	63 lbs. per sq. in.
7 days	610 „ „	178 „ „
Water used in mixing	24.5 per cent.	10.0 per cent.

Both the chemical analysis and the physical examination show that the cement is first-class.

Analysis of the Deposit.
Now the first step was to make an analysis of the white deposit taken from the surface of a concrete block. The result of this operation was that the deposit was found to be composed of—

Silica	-	-	-	-	-	Per cent.
Alumina and iron oxide	-	-	-	-	-	6.74
Lime	-	-	-	-	-	2.20
Magnesia	-	-	-	-	-	10.15
Anhydrous sulphuric acid	-	-	-	-	-	2.86
Carbon dioxide	-	-	-	-	-	6.45
						39.66
						68.06

leaving a balance of 32 per cent., which on analysis proved to be largely a soda compound. This would, in the deposit, be combined with the carbon dioxide in the form of sodium carbonate to the extent of 70 per cent. of the total. The above analysis shows conclusively that the deposit is nearly all sodium carbonate with a small percentage of a sulphur compound, very probably calcium sulphate, as this substance is often added to a cement in manufacture to make it slow setting. The silica, iron oxide, alumina, lime and magnesia, in all probability had been in the small quantity of cement that was scraped from the concrete block while sampling.

The Result of washing the Cement.
Now after treating the cement in the manner suggested, and collecting the scum that appeared on the surface of the water, and also the surplus water, the scum was found to be composed of—

Silica	-	-	-	-	-	Per cent.
Alumina and iron oxide	-	-	-	-	-	19.45
Lime	-	-	-	-	-	6.50
Anhydrous sulphuric acid	-	-	-	-	-	47.94
Magnesia	-	-	-	-	-	4.48
Carbon dioxide	-	-	-	-	-	2.08
						16.73
						97.19

The low percentage of lime, with the high percentage of carbon dioxide indicates, Mr. Johnston thinks, that the fine underburned particles of cement rise during the manipulation and with, of course, a large proportion of cement form a scum. In this scum is a considerable quantity of sulphuric acid. The scum weighed only a small fraction of 1 per cent. of the total cement used. The analysis of the surplus water disclosed the fact that the objectionable sodium carbonate was in solution. In fact, from 800 grains of cement 3,563 grains of sodium carbonate were obtained, or nearly 0.5 per cent.

An analysis of the cement in the first place showed alkalies (or sodium oxide and potassium oxide) 0.82 per cent. Now assuming that three-fifths of this 0.82 per cent., or about 0.5 per cent., of the cement was sodium oxide, we could have 0.8 per cent. of sodium carbonate, or in other words there was only enough sodium in the cement to make 0.8 per cent. of sodium carbonate. Nearly 0.5 per cent. had been removed by the treatment, and as some of the sodium must be intimately combined with the cement, there could not, in Mr. Johnston's opinion, be enough left to cause an appearance of the white surface deposit.

Strength not affected by Treatment.
A test made of the cement, after the treatment, shows that the strength in a few days was considerably increased. The following is the result of the test:—

Tensile strength	-	-	-	3 (sand) to 1 (cement).
24 hours	-	-	-	41 lbs. per sq. in.
4 days	-	-	-	162 „ „
7 days	-	-	-	215 „ „

Referring to the test of the cement before treatment, it is seen that the tensile strength 3 to 1 was for twenty-four hours 63 lbs. per sq. in.; for seven days, 178 lbs. per sq. in., or after treatment to remove sodium carbonate, the strength of the 3 to 1 concrete was in twenty-four hours 35 per cent. lower than when not treated, due entirely to the fact that a large percentage of water was of necessity used in mixing, and when such is the case the hardening is more gradual than when mixed drier. In seven days, however, it was, as shown by the above, 21 per cent. higher than in the ordinary test.

The above analysis and figures tend to show conclusively that the treatment not only gets rid of the objectionable sodium carbonate, the cause of the white surface deposit, but also increases the strength of the concrete.

Effect of Dust in Aggregate.
Mr. Johnston also made a test to establish the relative values of aggregate with and without dust. The result of the tests was to establish in every case greater strength for the mortar which included the dust.

1 Part Lehigh Cement with 3 Parts of—	Tensile Strength (lbs. per sq. in.) 7 days. (Average of 4 tests in each case.)
Unscreened limestone	366
Limestone retained on No. 100 sieve (without fine powder)	343
Limestone that passes No. 6 sieve and is retained on No. 100 sieve (i.e., without powder)	410
Limestone that passes No. 8 sieve and is retained on No. 100 sieve (i.e., without powder)	381
Limestone that passes No. 10 sieve and is retained on No. 100 sieve (i.e., without powder)	360
Limestone that passes No. 10 sieve and is retained on No. 100 sieve (i.e., without powder)	356
Limestone that passes No. 10 sieve and is retained on No. 100 sieve (i.e., without powder)	339
Lake sand (Sand and Dredging Co.)	295
Standard quartz sand	270
Limestone dust (i.e., what passes No. 100 sieve)	191
	202

THE TIMBER TRADE.

London Market in July.

REPORTS of the London timber trade during July are to hand, but further reports (more especially those of Messrs. Churchill & Sim, relating to soft woods) are yet to come and will be published in our next issue.

Messrs. Denny, Mott & Dickson, Ltd., report that the heat and holiday season combined to rob business of all animation during July, and nothing beyond hand-to-mouth business can now be expected until the concluding quarter of the year. The hardwood market generally has been in a sound condition with advancing values, which are justified by the moderate supplies. The softwood trade has, however, been consistently dull, and whilst it has been generally felt that there has been no room for prices to go lower, it must be acknowledged that selling rates still give little or no profit to holders after due allowance for storage and interest changes.

American Whitewood.—While first quality is fairly steady, the lower grades are doing badly. The supply of medium quality and culls is far in excess of the demand. Prices range from 2s. 3d. to 3s. 6d. per cub. ft. for first quality, 1s. 9d. to 2s. for clear saps, 1s. 6d. to 1s. 9d. for medium, and 1s. to 1s. 3d. for culls.

Hardwoods.

Teak.—Messrs. Denny, Mott & Dickson, Ltd., report that the landings in the docks in London during July consisted of 189 loads of logs and 261 loads of planks and scantlings, a total of 450 loads, as against 264 loads for the corresponding month of last year. The deliveries into consumption were 1,081 loads of logs and 295 loads of planks and scantlings—together 1,376 loads, as against 616 loads for July, 1904. The inadequate supplies of first-class timber are, as expected, causing experimental shipments of distinctly inferior or second-class quality to come forward in increasing quantity. Consumers, however, are not yet prepared to buy unsightly wood—even at a very appreciable reduction; but in a time of scarcity conservatism may bow before necessity, and it is now beyond controversy that the supply of first-class timber for some time ahead cannot fill the demand.

Mahogany.—Supplies have been insignificant; and although the volume of business is restricted by the unduly light stocks, the tone of the market is somewhat better, and prices are naturally harder for such small supplies as have been obtainable at auction.

Odessa Oak.—The enquiries for this wood continue to out-run the volume of supply. Prices have hardened very appreciably, and consumers have shown very clearly that careful shipments of this high-class wood will find a ready market, and it is to be hoped that the political disturbances at Odessa will not hamper the production.

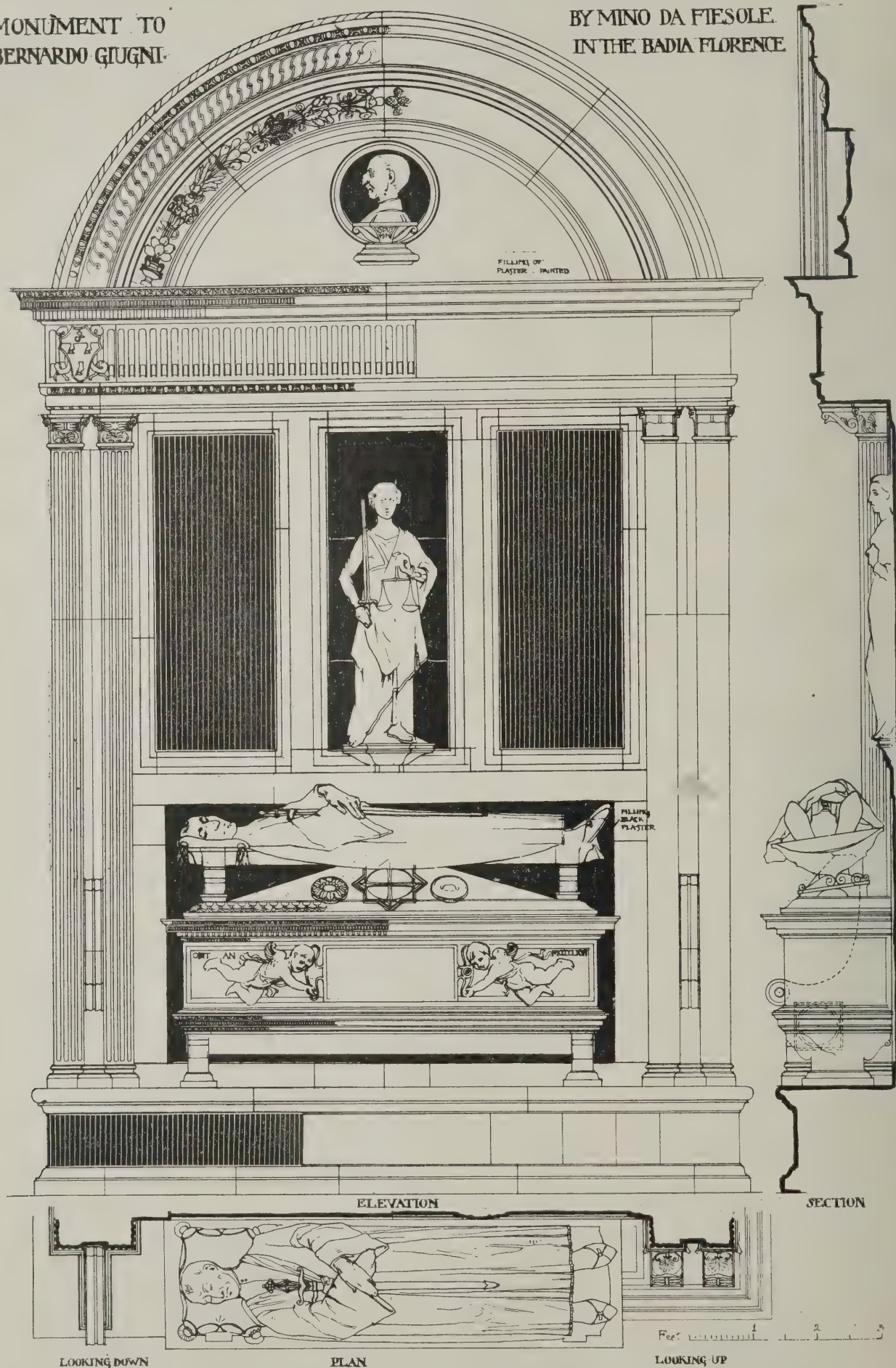
Obituary.

Lieut.-Col. Stirling died suddenly in an Edinburgh hotel recently. He was an architect and surveyor, and for twenty-one years had been borough assessor of Stirling.

Mr. Thomas Finlayson, civil engineer, whose death in his eighty-sixth year is announced, entered the office of Messrs. Ross & Mitchell in early life and did useful work in connection with the construction of the Balloch Mile Bridge in Ayrshire, which was then the largest stone bridge in the world. In 1859 he went to India as civil engineer in connection with the then new Madras Railway. He retired from active service in 1862.

MONUMENT TO
BERNARDO GIUGNI.

BY MINO DA FIESOLE.
IN THE BADIA FLORENCE.



Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :			
Aug. 10	Caerphilly—Cemetery Works	Urban District Council	Surveyor's Department, Council Offices, Caerphilly.
10	Cork—Stables	Guardians	J. Cotter, Clerk to the Guardians, Cork.
10	Finchley—Schools	Urban District Council	W. G. Wilson, Architect, 5 Bloomsbury Mansions, Hart Street, WC.
11	Queensbury, Yorks—Shop	Economic Stores	Jackson & Fox, Rawson Street, Halifax.
11	Rhymney—Altering Royal Hotel...	Buchan & Co.	T. Roderick, Architect, Aberdare.
11	Golcar—Houses	—	A. Shaw, Architect, Golcar.
12	Ripponden, Halifax—Engine-house	—	C. F. L. Horsfall & Son, Lord Street Chambers, Halifax.
12	Six Bells, Abertillery, Mon.—Chapel	—	R. L. Roberts, Architect, Abercarn.
12	Fowey, Cornwall—School	Governors	Headmaster, Grammar School, Fowey.
12	Walsall Wood, Staffs—School	Education Committee	G. Balfour, Director of Education, Stafford.
12	Ryde, Isle of Wight—Cottages	Corporation...	Borough Engineer, Town Hall, Ryde.
12	Brithdir, Merthyr Tydfil—Repairing 100 Houses	Dwellings Supply Co.	C. M. Davies, Merthyr Tydfil.
12	Stafford—School, &c.	Education Committee	Committee's Offices, Stafford.
12	Holmer, Hereford—Cemetery Works	Parish Council	Heywood & Son, Hereford.
12	Burrington, Devon—Restoration of Farmhouse, &c.	—	J. Hannaford & Son, Chulmleigh.
14	Maybury, Woking—School	Education Committee	Jarvis & Richards, 36 Victoria Street, S.W.
14	Abercynon—Houses	Taff Building Club	W. Dowdeswell, Architect, Treharris.
14	Baldwinholme, Carlisle—Alterations	Mr. N. E. Thompson	G. Armstrong, 24 Bank Street, Carlisle.
14	Cullen, Ireland—Church	—	S. F. Hynes, 21 South Mall, Cork.
14	Glyn Neath—Chapel Alterations...	Building Committee	J. Cook Rees, Architect, Neath.
14	Ilford—Stabling	Urban District Council	Surveyor, Town Hall, Ilford.
14	Kingswood, Bristol—Alterations to Church	—	Walker & Son, College Green, Gloucester.
14	Llantwitfardre, Wales—Library	Urban District Council	A. Lloyd Thomas, Church Street Chambers, Pontypridd.
14	Finchley—Electricity Station	Education Committee	Electrical Engineer, Electricity Works, Finchley, N.
15	Aylesbury—Schools	—	J. M. & H. Kennard, Architects, 13 Railway Approach, London Bridge.
15	Merthyr—Renovating Chapel	Council	C. M. Davies, 112 High Street, Merthyr.
15	Middlewich—School...	Lewis-Merthyr Colliery Co.	J. Cawley, Architect, Bull Ring, Northwich.
15	Senghenydd—Cottages	—	J. H. Phillips, Clive Chambers, Windsor Place, Cardiff.
15	Trerose, Cornwall—Residence	Education Committee	Row & Corbyon, Market Strand, Falmouth.
15	Sudbury—Classroom	District Hospital Committee	Committee Offices, 5 Crown Street, Bury St. Edmunds.
15	Minehead—Hospital...	Urban District Council	J. R. Davis, 18 The Avenue, Minehead.
16	Hampton, Middlesex—Fire-station, &c.	Guardians	S. H. Chambers, Public Offices, Hampton.
16	Barnet, Herts—Additions to Workhouse	J. Caesar	White, Son & Pill, 13 High Street, Barnet.
16	Fernhurst, near Haslemere—House	County Council	M. Childs, Bridgeland, Fernhurst.
16	Kirton, Lincs—Lengthening Bridge	Fulham Borough Council	L. Starkie, Wellington House, Skirbeck.
16	London, S.W.—Buildings...	—	F. Wood, Town Hall, Fulham.
16	Milnsbridge, Yorkshire—Residence	—	Lunn & Kaye, Architects, Milnsbridge.
17	Kettering—Church	—	Rev. G. W. Wellburn, Sunrise, St. Peter's Avenue, Kettering.
17	Burley-in-Wharfedale—Houses	Lunatic Asylum Committee	Milnes & France, 99 Swan Arcade, Bradford.
18	Downpatrick, Ireland—House	Skipton Cattle Market Co.	Asylum, Down.
18	Skipton—Cattle Market	—	J. W. Broughton, Architect, 19 High Street, Skipton.
19	Malton—Church Restoration	Trustees	C. H. Channon, Architect, Malton.
21	Methwold, Norfolk—Chapel Repairs	Plans and Buildings Committee.	Whitta & Sons, Methwold.
21	Nelson, Lancs—Setting back Walls	College Council	B. Ball, Borough Engineer, Town Hall, Nelson.
22	Cardiff—College Foundations	Urban District Council	W. D. Caroe, Architect, 8A Whitehall Place, London.
23	Shipley—Fire-station	Pontypridd U.D.C.	W. H. Beever, 26 Bond Street, Leeds.
23	Pontshonorton—School	—	P. R. A. Willoughby, Pontypridd.
ENGINEERING :			
Aug. 10	Fleetwood, Lancs—Gas Engines	Urban District Council	G. R. Strachan, 9 Victoria Street, S.W.
11	Droitwich—Water Mains	Borough Council	A. Hulse, Borough Surveyor, Droitwich.
11	Swansea—Switchboards	Corporation...	Telephone Manager, Pier Street, Swansea.
12	Millport, Scotland—Reservoir	Town Council	Niven & Haddin, 131 West Regent Street, Glasgow.
12	Alnwick—Bridge-works	Rural District Council	H. W. Walton, Clerk, Alnwick.
12	Earlestown, Lancs—Lorry	Urban District Council	A. Bowes, Town Hall, Earlestown.
12	Bishop's Stortford—Pumping Engine	Urban District Council	T. Swattheridge, Council Offices, 7 North Street, Bishop's Stortford.
14	Appleby, Lincs—Reservoir	Urban District Council	A. Atkinson, Brigg.
14	Carlisle—Reservoir	Corporation...	J. Mansergh & Sons, 5, Victoria Street, S.W.
14	Lymington—Concrete and Oak Bridge	Rural District Council	J. D. Rawlings, 38 High Street, Lymington.
16	Amsterdam—Axles	Commercial Intelligence Branch of Board of Trade.	M. Mart. Nighoff, Bookseller, The Hague.
16	Clare, Suffolk—Borehole	Rural District Council	Sands & Walker, Milton Chambers, Milton Street, Nottingham.
17	Bromsgrove—Sewage Tanks	Barnsby Hall Asylum Committee	Willcox & Raikes, 63 Temple Row, Birmingham.
IRON AND STEEL :			
Aug. 10	Swansea—Rails	Harbour Trustees	T. Strick, Harbour Offices, Swansea.
12	Ryde, I.W.—Iron Fencing	Corporation	Borough Engineer, Town Hall, Ryde.
12	Paris—Iron Pipes	—	Post and Telegraph Department, Rue de Grenelle, No. 103, Paris.
15	Callao—Piping	Corporation	Graham, Rowse & Co., Mersey Chambers, Liverpool.
9	Mussoorie, India—Pipes, &c.	Municipal Board	C. H. Shanani, Municipal Office, Mussoorie.
PAINTING AND PLUMBING :			
Aug. 10	Hammersmith—Painting Town Hall	Borough Council	H. Mair, Borough Surveyor, Town Hall, Hammersmith.
11	Celbridge, Ireland—Painting Dispensary	Guardians	J. J. Inglis, Union Workhouse, Celbridge.
12	Nottingham—Painting Properties	Estates Committee	City Architect's Office, Nottingham.
14	Hendon—Painting and Plastering	Urban District Council	S. Slater Grimley, Surveyor, Council Offices, Hendon, N.W.
ROADS AND CARTAGE :			
Aug. 10	London, N.—Private Street Works	Finchley U.D.C.	Engineer and Surveyor to the Council, Finchley, N.
12	Stamford—Granite	Town Council	F. R. Ryman, Borough Surveyor, 8 St. Mary's Street, Stamford.
12	Luddenden Foot—Setts	Urban District Council	Surveyor, Council Offices, Luddenden Foot, Yorks.
19	Barnet—Making-up Road	Urban District Council	H. W. Mansbridge, Surveyor, 40 High Street, Barnet.
23	London, S.W.—Roads and Sewers	—	H. R. G. S. Smallman, 8, Queen Street, Cheapside, E.C.
24	London, N.—Road Works	Hornsey Town Council	E. J. Lovegrove, Borough Surveyor, 99 Southwood Lane, Highgate.
4	Southampton—Stone	Corporation...	J. A. A. Crowther, Borough Engineer, Southampton.
SANITARY :			
Aug. 12	Wigan—Sewerage Works	Rural District Council	Heaton, Ralph & Heaton, King Street, Wigan.
15	Birdwell—Extension of Sewers	Worsborough U.D.C.	J. Whittaker, Surveyor to the Council.
15	London, S.E.—Sanitary Work	Guardians	W. Thurnall, Guardians' Office, Brook Street, Kennington Road, S.E.
22	Chadderton—Sewers	Urban District Council	J. Diggle & Son, 14 Victoria Street, Westminster, S.W.
TIMBER :			
Aug. 15	Canterbury—Oak Fencing	Sanatorium Committee	A. C. Turley, City Surveyor, Canterbury.

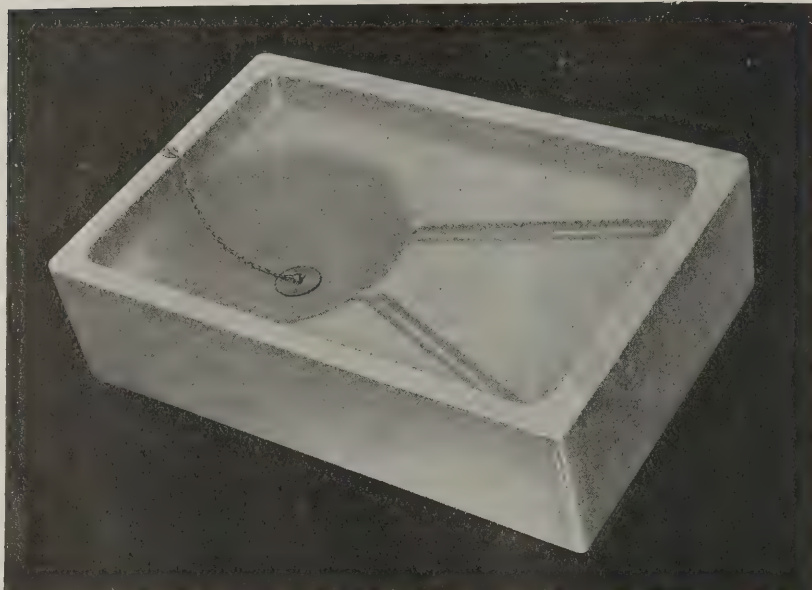
List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Aug. 26	Macclesfield—Schools	—	—	J. F. May, 43, Churchside, Macclesfield.
Sept. 1	Elgin—Cemetery Extension	£10 10s.	—	Stewart & M'Isaac Solicitors, Elgin.
23	Cheshunt—Library	—	£1 1s.	A. Colingwood Lee, Manor House, Cheshunt.
30	Dartmouth—Town Hall	£50, £30 and £20	—	A. Smith, Borough Engineer, Victoria Chambers, Dartmouth.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

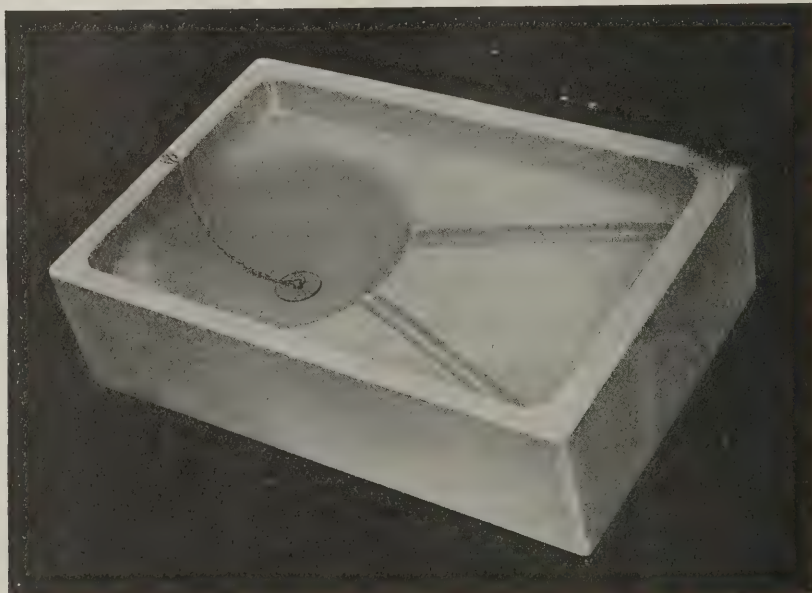
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SINK
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Invaluable for
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 Artizans' Dwellings,
 The Nursery,
 and in every
 Kitchen.



With the Plug
 out it is a
SINK.

WASH BOWL
 IN ONE.



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 in it is a
WASH BOWL.

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W. C. GIBSON & Co., Ltd., Fireclay Manufacturers,
 Scotswood-on-Tyne; 5 & 7, Old Queen Street, Westminster, London, S.W., &c., &c., &c.

Write for full Lists of every description of Sanitary Work for School, Hospital, Domestic Use, and Fireplaces,
 "Adamesk" Tiles, Terra Cotta, &c.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Brynmaur.—For various alterations, &c., at the police-station, for the Standing Joint Committee. Mr. Charles W. Best, M.I.C.E., county surveyor:—

R. Edwards, Tredegar	£1,853	5	4
Gwatkin Brothers, Abergavenny	1,784	2	0
J. Jenkins, Brynmaur	1,770	0	0

* Accepted.

Edrington.—For the erection of a new pavilion for male inmates, a chapel, and other works, at the work-house, for the Guardians of the Aston Union. Messrs. C. Whitwell & Son, architects, 23, Temple Row, Birmingham:—

J. Smith & Sons	£12,715
I. Langley	12,533
W. Bishop	12,468
J. A. Turton	12,296
A. C. Hughes	11,771
H. Willcock & Co.	11,486
W. H. James	11,277
H. Dorset	11,100
T. Elvins	11,045
B. Whitehouse & Sons	10,873
J. Dallow & Son	10,725
W. H. Gibbs	10,724
T. Johnson	10,611
W. Lee & Son, Avenue Road, Aston, Birmingham	10,599
E. Crowder	10,255

* Accepted. [Architects' estimate, £12,000.]

Feltham.—For alterations at the town hall, for the Middlesex County Council:—

W. Slark, Twickenham	£2,106
G. Parker, Peckham	1,875
W. R. & A. Hide, Hammersmith	1,863
Patman & Fotheringham, Islington	1,853
Spiers & Son, St. John's Wood	1,839
D. D. Heath, Chiswick	1,830
T. Hiscock, Hounslow	1,799
C. Ansell, Lambeth	1,781
T. W. Soole & Son, Richmond	1,750
J. C. Mather, Canonbury	1,745
H. Baker & Co., Staines	1,724
G. Godson & Sons, Kilburn	1,693
Wisdom Brothers, Isleworth	1,608
J. Dorey & Co., Brentford	1,603
A. Emmett, Feltham	1,595
T. J. Messom & Sons, Twickenham	1,589
J. Hebblethwaite, Twickenham	1,574
W. H. Hyde, Norwood Junction	1,444

* Accepted.

Gorseinon (Wales).—For the erection of an institute in Lime Street, for the Gorseinon and District Trades and Labour Council. Mr. Charles T. Ruthen, architect, Bank Chambers, Heathfield Street, Swansea:—

T. D. Jones, Swansea	£1,995
D. Jenkins, Swansea	1,779
H. Billings, Swansea	1,760
G. Mercer, Llanelly	1,710

* Accepted.

Hereford.—For the conversion of the present St. Peter's School into a Council school for 260 girls, for the Education Authority. Mr. John Parker, city surveyor:—

W. Powell	£1,200
E. W. Wilkes	1,150
W. Rowberry	1,138
D. Davies & Co.	1,130
W. Bowers & Co.	1,102
C. Cooke	1,070
J. C. Vaughan	1,035

* Accepted. [All of Hereford.]

Hove.—Accepted for additions to 74, The Drive, Hove, for Captain John Rose Auldjo. Mr. R. Owen Allsop, architect:—

E. Winter	£1,180	15	0
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Ilford.—Accepted for the erection of a temporary shelter in connection with the Ilford isolation hospital at Grove Road, Chadwell Heath, for the Urban District Council. Mr. Herbert Shaw, engineer and surveyor:—

F. & A. Willmott	£1,289
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HATCHETT'S RESTAURANT, FICCACILLY. RE-DECORATED WITH ASPINALL'S "SANALENE."

London, S.E.—For the erection of factory premises at Crofton Park Road, for Messrs. Alfred Graham & Co. Messrs. Bingham & Broughton, architects, Crofton Park, S.E. Quantities by Mr. T. Arthur Lewis, Croydon:—

F. Ward & Sons	£7,466
J. Burke	7,234
Courtney & Fairbairn	7,089
Perry Brothers	6,977
Longley & Co.	6,945
A. W. Jagers & Co.	6,900
Ashby Brothers	6,879
Kennard Brothers	6,800
Holloway Brothers	6,793
J. Smith & Sons	6,671
Thomas & Edge	6,666
T. D. Leng	6,560
H. L. Holloway	6,500
B. E. Nightingale	6,444
Edwards & Medway	6,429
W. H. Hyde	6,400
W. Nash	6,275

London, S.E.—For the erection of a laundry on a site of 136 and 138, New Kent Road, for Mr. F. W. Belleini. Mr. G. A. Lansdown, architect, 9, Regent Street, S.W.:—

W. Fitch	£7,492
Spencer, Santo & Co.	6,595
H. Burman & Sons	6,520
Sabey & Son	6,499
W. Smith & Sons	6,493
H. & E. Lea	6,237
Sayer & Son	6,227
Kirk & Kirk	6,173
C. Ansell	6,060
B. E. Nightingale	6,030
J. Marsland & Sons	5,985
W. Downs	5,973
Battley, Sons & Holness	5,947
Johnson & Co.	5,915
R. & E. Evans	5,818
T. G. Sharpington	5,748

* Provisionally accepted.

London, S.W.—For the erection of working-class dwellings, Bearcroft Buildings, New King's Road, Fulham, for the London County Council:—

John Appleby & Sons, Lambeth	£11,200	0	0
Spencer, Santo & Co., Westminster	10,904	0	0
Henry Lovatt, Ltd., London and Wolverhampton	10,715	0	0
R. Elvey, Southend-on-Sea	10,689	0	0
Kirk & Randall, Woolwich	10,637	0	0
H. L. Holloway, Deptford	10,530	0	0

S. E. Moss & Co., Southend-on-Sea	£10,492	0	0
J. Christie, Uxbridge Road, W.	10,215	0	0
B. E. Nightingale, Albert Embankment	10,191	0	0
G. E. Wallis & Sons, Ltd., Maidstone	10,189	0	0
Prestige & Co., Grosvenor Road	10,061	0	0
T. G. Sharpington, Nunhead	10,000	0	0
Martin, Wells & Co., Ltd., Vauxhall	10,000	0	0
J. Barker & Co., 83, Kensington High Street	9,975	0	0
S. N. Soole & Son, Richmond, Surrey	9,938	0	0
E. Lawrence & Sons, City Road	9,894	0	0
C. Wall, Ltd., Chelsea	9,828	0	0
F. & H. F. Higgs, Loughborough Junction	9,750	0	0
Holloway Brothers (London), Ltd., Lambeth	9,646	0	0
A. Faulks, Loughborough	9,527	13	3
W. Lawrence & Son, Waltham Cross	9,494	0	0
F. & T. Thorne, Isle of Dogs	9,435	0	0
J. Guttridge, Peterborough	9,433	0	0
J. Garrett & Son, 17, Balham Hill	9,307	0	0
A. Hudson & Co., Westminster	9,290	0	0
T. J. Hawkins & Co., Ashford	8,935	3	1

[Architect's estimate, £9,000.]

"Lowest satisfactory tender" recommended for adoption.

London.—For the construction of section E of the southern high-level sewer No. 2, for the London County Council:—

Hutchinson & Co.	£627,238	9	5
Muirhead, Greig & Matthews	557,278	6	9
L. P. Nott, Bristol	553,373	1	5
Bentley & Loch, Leicester	536,251	1	9
W. Kennedy, Ltd.	517,175	1	1
Perry & Co.	509,258	7	9
W. Scott & Middleton	494,785	10	10
J. W. S. Smith & Co.	484,419	16	0
Price & Reeves	478,023	15	11
J. Mowlem & Co.	474,490	8	9
G. Shellabear & Son, Plymouth	451,300	14	1
Joseph Howe & Co., West Hartlepool	450,509	10	1
R. H. Neal, Ltd., Plymouth	440,635	14	0
S. Pearson & Son, Victoria Street, S.W.	437,169	9	6
W. Moss & Sons, Ltd., Loughborough	391,503	8	3

* Accepted. [Rest of London.]

(Continued on p. xvi.)

**Guaranteed
Door Springs.**

**Guaranteed
Gearing and
Fittings.**

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Post Free on Application

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**ROBERT
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FANLIGHT OPENERS & GEARING.

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ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT, 3½ years' varied experience, able to prepare working drawings from rough sketches; surveying, levelling &c.; moderate salary.—X., 48, Thornton Avenue, Chiswick, W. 1240

ARCHITECT and SURVEYOR'S experienced and capable all-round ASSISTANT desires permanency. Thoroughly well versed in quantities, working drawings, construction, steelwork, details, surveying and levelling. Moderate salary.—H., Preston Villa, Markenfield Road, Guildford. 1238

ARCHITECT and SURVEYOR'S ASSISTANT, A.R.S.A.I., desires ENGAGEMENT; 10 years' varied experience. Measuring up, contract drawings, details, specifications, knowledge of quantities, surveying and levelling, superintending works.—Box 1278, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1278

ARCHITECT'S ASSISTANT (24) desires ENGAGEMENT. Good draughtsman. Designs, working drawings, details, perspectives, specifications; nine years' experience.—W. H. L., 83, Elspeth Road, Clapham Common, S.W. 1210

ARCHITECT'S Junior ASSISTANT (22½) desires SITUATION. Excellent draughtsman, well up in construction, working drawings, measuring and plotting, specifications. Could assist with quantities. Six years' experience.—S. W. H., Brookdale, Manor Road, Teddington. 1268

ARCHITECT'S ASSISTANT (32), Experienced Draughtsman and Designer, specifications and quantities, 55s. Country preferred.—TRAHO, 186, Worple Road, Wimbledon. 1237

ARCHITECT'S ASSISTANT requires situation; contract drawings half and full size, details, surveying, &c., and general office work. Moderate salary.—Box 1232, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1232

ARCHITECT'S ASSISTANT (23), six years' Midland experience, chiefly domestic; surveys, working drawings, details, &c.; low salary.—Z., "Ingleside," Olton, Birmingham. 1253

ARCHITECT'S ASSISTANT, 21 years' general and public experience; competent quantity surveyor. First-class references. Salary, 3 guineas.—Box 1261, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1261

ARCHITECT'S ASSISTANT (24) disengaged; competent; working drawings, all details, specifications; assist with quantities, land survey, &c.; moderate salary.—Box 1277, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1277

ARCHITECT'S Junior ASSISTANT (20) disengaged September 4th. Five years' experience. London or country. Working drawings, details, good tracer, colourist, &c. General office routine. Salary 25s.—A. G. S., "Kirkdale," Stanmore Road, Leytonstone, Essex. 1279

ARCHITECT'S Junior, disengaged; five years' exp.; details ½ in., ¼ in.; moderate.—Box 1213, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1213

BUILDER'S, &c. CLERK OF WORKS ASSISTANT (22); drawing, tracing, knowledge quantities and details; 4½ years in architect's office; certificates, building construction, advanced, 1st freehand, &c.—H. M. N., Thorncroft, Farnham, Surrey. 1243

BUILDER'S WORKING FOREMAN seeks permanency in private or jobbing firm in London district. Well up in all branches, plans, and details. Trade, bricklayer. Good references. Abstainer. Aged 30.—Wood, 80, Selwyn Avenue, Higham's Park, N.E. 1269

CLERK OF WORKS, good draughtsman, setter-out, sanitary engineering, quantities, seeks position as ASSISTANT; thoroughly practical, trustworthy, and reliable.—D., 9, Lambeth Palace Road, London, S.E. 1242

CARPENTER and JOINER with 16 years' experience, wants piecework labour only or as working foreman; good references: distance no object; estimates given.—Apply, D. W., 58, Wellington Street, Gravesend, Kent. 1208

CRANE or ENGINE DRIVER FITTER, take charge of plant, thoroughly experienced; young man seeks situation.—F. W., 12, Comboss Road, White Post Lane, Victoria Park. 1276

ELECTRIC LIGHTING, BELLS, TELEPHONES, &c. First class workmanship, moderate charges, estimates free.—G. CORNER, 3, Laurel Grove, Sydenham, S.E. 1224

FOREMAN of JOINERS seeks situation with a firm which turns out first-class work. Accurate setter out. Good references.—Box 1231, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1231

GENERAL FOREMAN, just finished contract, wants RE-ENGAGEMENT. Thoroughly competent in all branches. Energetic and reliable. Punctual time-keeper. Excellent London references.—G. T., Netherbrook, Nether Street, Finchley, N.E. 1263

GENERAL FOREMAN or CLERK OF WORKS shortly disengaged, seeks RE-ENGAGEMENT, experienced in all branches. Reliable and accurate setter-out; good references; wages moderate; aged 48.—Box 1284, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1284

GENERAL or WORKING FOREMAN (Carpenter). Building alterations, or sole charge, good jobbing. Good Manager of men. Practical experience in all branches.—W. A., 88, Stebert Road, Westcombe Park, S.E. 1227

MACHINIST. Competent spindle and all-round hand; first-class saw sharpener, cutter maker, &c. Good references.—Box 1260, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1260

MACHINIST (Joiners), spindle, tenon, general joiner, moulding, machines, &c.; all-round hand; take charge and set out if required; good references and reliable.—JOINER 65, Fairfield Road, Bow, E. 1265

MACHINIST (24), spindle hand improver; can also work saw bench, band saw, overhead and panel planer; make cutters, sharpen saws.—MACHINIST, 18, Lausanne Road, Peckham, S.E. 1266

PAINTER.—Good all-round hand wants JOB, town or country. Abstainer.—A. R., 43, Bassett Street, Kentish Town, N.W. 1236

PAINTER.—WORKING FOREMAN desires ENGAGEMENT. Good all-round man in all branches of the trade. Refs.; abstainer.—F. R., 43, Bassett Street, Kentish Town, N.W. 1235

PAPERHANGER, good, wants piecework. Distance no object.—C. MARKHAM, 11, Great Sutton Street, Clerkenwell, E.C. 1234

PLUMBER, GAS and HOT WATER, seeks Situation; able to take charge of Estate work, can fill up Painting. Abstainer.—A. M., 167, Griffin Road, Plumstead. 1252

PLUMBER (young), gas, hot-water, zinc, electric bells, well up in the latest sanitary improvements, used to speculating work or good shop.—M., 52, Poplar Walk Road, Herne Hill, London. 1239

PLUMBER.—Reliable Man REQUIRES JOB or CONTRACT for Sanitary Work.—W. PHILLIPS, 9, Selwood Street, Rotherhithe, S.E. 1209

QUANTITY SURVEYOR'S ASSISTANT (22). Working up, &c., also neat draughtsman. Moderate salary.—Box 1223, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1223

TO ESTATE and PROPERTY OWNERS.

A thorough practical Speculating Builder, who has covered large estates, desires the management of an estate. Superintending and carrying out any class of building, alterations or repairs. Would cover an estate for freeholder with large or small property on arranged terms, undertaking to give all services usually rendered by a builder.—C. F., Springfield Cottage, Horn Lane, Acton, W. 1280

YOUNG ARCHITECT, 7 years' London and provincial experience, and passed part of R.I.B.A. Final, desires further London experience in designing and execution of buildings. Would accept position in good office without salary. 1264

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ARCHITECTURAL ASSISTANT, proficient in School Work, required at ONCE. Apply, stating age, experience, and salary, and enclosing specimens of work and copies of testimonials, to HENRY T. SANDY, Architect, Stafford. 1242

MANAGER WANTED FOR DECORATOR'S and GENERAL BUILDER'S business (London). Must be of good address and able to take management, including estimating without supervision. Rent, rates, and taxes free. Send full particulars of qualifications, salary expected and references to "MANAGER," c/o Hooper & Batty, 15, Walbrook, E.C. 1242

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DESIGNS for SUBURBAN RESIDENCES prepared to suit clients. Plans and Specifications for new work and alterations. Drain Plans at specially low fees.—J. LAWRENCE, jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W. 1241

DRAIN PLANS PREPARED. Drains Tested, Sanitary and General Surveys and Reports.—J. LAWRENCE, jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W. 1241

DRAWINGS from rough sketches, designs, details, specifications, drain plans and quantities prepared. Terms moderate.—J. W., 8, Rylett Crescent, Shepherd's Bush, W. 1241

TO ARCHITECTS.—Assistance given in all work at advertiser's home. First-class Tracings made.—A. MANDER, 16, Lonsdale Square, Barnsbury, N. 1251

Businesses Wanted & for Sale.

BUILDERS' AUCTIONEERS and DECORATORS' BUSINESS for SALE in the West of England. 80 years in same family. Average turnover £3,500 a year.—Box 1285, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, London, E.C. 1285

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SHARE OF OFFICES.—Provincial Architect will share his City offices with Quantity Surveyor or another Architect.—Box 1225, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1225

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YOUNG ARCHITECT, 10 years' London and provincial experience, of artistic and practical ability, desires ENGAGEMENT with Architect with a view to purchasing Junior Partnership. Highest references from some of the most influential members of the profession. Speciality: Domestic work.—Apply, Box 1262, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1262

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AGENCY WANTED FOR HIGH-CLASS GOODS for Sanitary Work or Machinery of every description. A large connection with Councils Engineers, Contractors, &c. Good Central London Showroom can be had. Terms liberal.—Apply Box 1222, BUILDERS' JOURNAL Office, 6, Great New Street, E.C. 1222

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CHURCH SEATING FOR SALE. Tenders are invited for the removal of a large quantity of varnished deal seating, of comfortable pattern and in good condition; a rostrum and other fittings, which are at present at the London Road Chapel, Greenwich. Specification, forms of tender, and full particulars may be obtained from J. F. BULL, Surveyor, 52, Bedford Row, W.C. 1241

MARBLE and GRANITE WORK. Speciality, Shopfittings, Steps, and Monuments.—KELLY & Co., Masons, Mill Hill, N.W., also Kilburn N.W., and Harpenden, &c. Telephone, 1159 Hampstead. 1241

POLING BOARDS, selected lengths and thicknesses (best quality and full measure). Also Scaffold Boards, Putlogs, Scantlings, Deals, Battens, and Boards. Lowest wharf prices. C. H. GLOVER & Co., Ltd., Importers, Hatcham Saw Mills, Old Kent Road, S.E. 1241

SAWN OAK PARK PALING, 6 inches wide, 4s. 100 ft. run.—MAY and BUTCHER, Timber Merchants, Heybridge, Maldon, Essex. 1241

TO BUILDERS and HOUSEBREAKERS. Wanted, old Lead Roofings, Gutters, Pippings, &c. Contracts entered into for regular deliveries.—Send particulars and prices to J. A. FULLILOVE, Market Harborough. 1241

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Telephone, No. 1011 HOLBORN. Manager—JOHN B. THORP. Telegrams: "DIVIDITORE," LONDON.

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E. C. HUGHES,

Builder and Contractor,
Albion Works, Wokingham.

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CHILDREN'S HOMES, Farnborough.
£13,600.

Messrs. HOLMAN & GOODHAM, Archts., London.
HOTEL and SHOPS, Henley-on-Thames.
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Wokingham. £5,600.

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Sir W. G. F. Phillimore, Bart.

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ADDITIONS, Easthampstead. £6,500.
CHAS. SMITH & SON, Architects, Reading.

Educational.

R. I. B. A., SOCIETY OF ARCHITECTS
AND CIVIL SERVICE TECHNICAL
EXAMINATIONS, preparation by correspondence or
residence. 29 first places.—G. A. T. MIDDLETON,
19, Craven Street, Strand.

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating.—For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

R. I. B. A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for syllabus to Mr. A. G. BOND, B.A. Oxon., A.R.I.B.A., 115, Gower Street, London, W.C. (late Howgate and Bond).

STRUCTURAL STEELWORK

Correspondence Classes specially for Architects, Assistants, Surveyors, Builders, and Draughtsmen, by the MIDLAND ENGINEERING BUREAU, STRAND, DERBY. Specialists in American and Continental Construction. Thorough Tuition. Send for descriptive booklet J., and read opinions of past students, and press notices, &c.

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To Contributors.

THE EDITOR will be pleased to consider any articles, illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

EMPLOYMENT REGISTER.

Too late for Classification.

1284.—GENERAL FOREMAN or Clerk of Works (48); exp. in all branches; accurate setter-out; good refs.; mod. s.

See p. xx for the Employment Register.

Contracts Open.

BUCKS COUNTY EDUCATION COMMITTEE.

The Education Committee invite APPLICATIONS from firms of Contractors desirous of TENDERING for the ERECTION of new ELEMENTARY SCHOOLS, for about 750 children, proposed to be erected at Aylesbury, in accordance with the drawings and specifications prepared by the Architects, Messrs. JOHN MOIR KENNARD and HAROLD KENNARD, 13, Railway Approach, London Bridge, London, S.E., and quantities prepared by Messrs. W. T. FARTHING & SON, 46, Strand, London, W.C.

A charge of £1 rs. will be made for each set of quantities issued to applicants, which will be returned on receipt of bona-fide Tender on or before the prescribed date. The firm whose Tender is successful will, if the work be proceeded with, be required to enter into a Contract and bond with two approved sureties to the amount of £500 for the due performance of such Contract.

The Committee do not bind themselves to accept the lowest or any Tender for the work. Drawings, specifications, and conditions may be seen at the Office of the ARCHITECTS, or by appointment at the Department of CLERK of WORKS, Education Office, Aylesbury.

Applications must be sent to the undersigned on or before the 15th day of AUGUST, 1905. Tenders must be submitted not later than WEDNESDAY, 20th SEPTEMBER, 1905, and endorsed "Tender, Aylesbury Council School."

C. G. WATKINS,
Education Secretary.
Education Office,
Aylesbury.

KENT EDUCATION COMMITTEE. TO CONTRACTORS.

The Kent Education Committee invite TENDERS for the ERECTION of a NEW COUNCIL SCHOOL at Eynsford Crockenhill, Kent.

The drawings and specifications may be inspected at the Office of the Architect, Mr. W. HARSTON, 8, Hythe Street, Dartford, where also bills of quantities and form of Tender may be obtained on and after FRIDAY, the 11th day of AUGUST, 1905, on payment of a deposit of £1. The deposit will be returned on receipt of a bona-fide Tender.

Tenders, on the form supplied, to be delivered to Mr. J. C. HAYWARD, Sessions House, Dartford, not later than TWELVE NOON on MONDAY, the 21st day of AUGUST, 1905.

The Committee do not bind themselves to accept the lowest or any Tender.

By Order of the Committee,
FRAS. W. CROOK,
Secretary.

Scale of Charges.

For Official Advertisements.

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Competitions, Contracts, all Notices issued by Corporate Bodies, Local and other Boards, Prospectuses of Public Companies, and Trade Paragraph Advertisements (minimum 4s. 6d.)	0 9
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Four lines or under (about 30 words)	1 6
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I.—Free Monthly Advertisements.

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3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

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1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.

OFFICE: 6, GREAT NEW STREET, FETTER LANE E.C.

TENDERS—cont. from p. xiii.

London, E.—For the erection of the first section of working-class dwellings, Bekesbourne Buildings, in London Street, Ratcliff, for the London County Council:—

John Appleby & Sons, Lambeth	17,969	17	6
Henry Lovatt, Ltd., London and Wolverhampton	16,962	19	0
H. L. Holloway, Deptford	16,941	0	0
Kirk & Randall, Woolwich	16,263	4	10
T. G. Sharphington, Nunhead	16,229	14	0
B. Nightingale, Albert Embankment	15,992	14	3
Martin, Wells & Co., Ltd., Vauxhall	15,958	8	3
E. Lawrence & Sons, City Road, N.	15,801	8	7
F. J. Coxhead, Leytonstone	15,799	17	3
S. E. Moss & Co., Southend-on-Sea	15,730	17	8
Holloway Brothers (London), Ltd., Belvedere Road, S.E.	15,636	5	1
Joseph Guttridge, Peterborough	15,597	4	10
John Garrett & Son, 17, Balham Hill, S.W.	15,359	16	8
C. Wall, Ltd., Chelsea	15,279	10	3
F. & H. F. Higgs, Herne Hill	15,183	19	11
W. Lawrence & Son, Waltham Cross	14,472	19	0
T. J. Hawkins & Co., Ashford	14,182	17	10½
F. & T. Thorne,* Island Joinery Works, Isle of Dogs	14,105	3	3

[Architect's estimate, £15,029 14s. 1d.]
* Recommended for acceptance.

London, S.W.—For additions and alterations to the basement of the public library, Manresa Road, Chelsea, for the Public Libraries and Museums Committee:—

W. F. Picken	14,424	10	0
J. Shelbourne & Co.	1,393	0	0
Fire-resisting Corporation	1,375	0	0
H. Lovatt	1,338	0	0
G. Wade	1,314	0	0
O. Craske	1,300	0	0
Patman & Fotheringham	1,286	0	0
Martin, Wells & Co.	1,280	0	0
W. Norton	1,271	0	0
Holloway Brothers	1,271	0	0
Vigor & Co.	1,263	0	0
Turton & Appleton	1,223	0	0
C. P. Roberts	1,222	0	0
B. E. Nightingale	1,217	0	0
H. Kent	1,203	0	0
Lole & Co.	1,197	0	0
T. Pearce	1,183	14	6
G. Pride	1,175	0	0
Whitehead & Co.	1,175	0	0
J. Christie	1,153	19	0
J. & W. Drake*	1,136	2	9

* Accepted.

Pontypool.—For the proposed rebuilding of the 'George Hotel,' for Messrs. Phillips & Sons, Ltd., Newport. Messrs. Swallow & Havard, architects and surveyors, Dock Street, Newport. Quantities by architects:—

W. Jones & Son	£2,577	0	0
W. P. Lewis, Hereford	2,575	0	0
Clements & Co.	2,510	0	0
J. Linton & Co.	2,500	0	0
J. Charles	2,489	0	0
E. C. Jordan	2,457	0	0
J. Dean & Son	2,448	0	0
J. Edwards & Co., Monmouth	2,405	0	0
J. Jenkins, Ltd.	2,375	4	0
D. W. Richards, Ltd.	2,375	0	0
C. H. Reed	2,307	0	0
E. R. Evans, Cardiff	2,298	6	9
Bowers & Co., Hereford	2,257	10	0
A. S. Morgan & Co.*	2,189	0	0

* Accepted. [Rest of Newport.]

Pontypridd.—For alterations and additions to the girls' and infants' departments of the Coedpenmaen School, for the Urban District Council. Mr. P. R. A. Willoughby, surveyor:—

W. Davies, Hopkinstown	£2,117	0	0
E. Lewis, Treforest	1,650	0	0
Williams & James, Pontypridd	1,550	0	0
D. Griffiths,* Pontypridd	1,450	13	10

* Accepted.

Sheffield.—For the erection of a public elementary school at Manor, for the Education Committee. Messrs. C. & C. M. Hadfield, architects, Cairns' Chambers, 19, St. James's Street, Sheffield. Quantities by Mr. Leon A. Francis, 8, John Street, Adelphi, W.C.:—

Ash, Son & Biggin	£7,870	0	0
A. Bradbury	7,747	0	0
W. & A. Forsdike	7,500	0	0
S. C. Boul	7,449	0	0
W. May & Son	7,200	0	0
J. Fidler, Ltd.	7,017	0	0
J. Vasey & Son	7,096	0	0
Wellerman Brothers	6,970	16	0
J. Eshelby & Son	6,905	0	0
J. & H. Wheen	6,870	0	0
H. Boot & Son	6,800	0	0
J. S. Robertson	6,757	0	0
Dawson, Jones & Co.	6,739	0	0
D. O'Neil & Son	6,224	0	0
T. Wilkinson & Sons,* Guernsey Road, Sheffield	6,214	0	0

[Architects' estimate, £6,500.]
* Accepted provisionally.

Shenley Hill (Herts).—For rebuilding house, &c., for Mr. F. W. Ranken Hore, Mr. Frank T. Baggallay, F.R.I.B.A., architect, 50, Berners Street, Oxford Street, W. Quantities by Mr. F. R. Smith, surveyor, 13, Victoria Street, Westminster, S.W.:—

W. Holt & Sons	£7,350
J. Simpson & Sons	7,185
W. H. Lascelles & Co.	7,050
N. Lidstone	6,992
O. Miskin & Sons	6,900
Boff Brothers*	6,732

* Accepted.

Sketty.—For the erection of seventeen houses in Harry Street. Mr. Charles T. Ruthen, architect, Bank Chambers, Heathfield Street, Swansea:—

T. Richards	£4,120	0	0
W. Evans	4,120	0	0
T. D. Jones	4,000	0	0
J. & D. Jones	3,950	0	0
C. Marles	3,652	10	0

* Accepted. [All of Swansea.]

Uxbridge.—For proposed extensions and offices at the company's works, Waterloo Road, Uxbridge, for the Uxbridge and District Electric Supply Co. Mr. William L. Eves, A.R.I.B.A., architect, 54, High Street, Uxbridge:—

G. Bollom, Acton	£2,356
C. F. Kearley, Uxbridge	2,139
Fassnidge & Sons, Uxbridge	2,122
Kingerlee & Sons,* 35, Queen Street, Oxford	1,987

* Accepted.

West Ham.—For the erection of tramway offices and car depot, for the Borough Council. Mr. John G. Morley, borough engineer:—

Shelbourne & Co.	£40,227	0	0
Wilkinson Brothers	37,536	0	0
Yates & Co.	36,550	0	0
West Brothers	36,206	0	0
Horlock & Son	36,034	0	0
F. Webster	35,921	15	9
W. H. Hyde	35,400	0	0
F. J. Stanbury	35,391	0	0
Perry & Co.	33,987	0	0
H. Lovatt, Ltd.	33,900	0	0
J. E. Johnson & Son	32,730	0	0
A. Faulks	32,725	9	6
Martin, Wells & Co.	32,650	0	0
W. Manders	32,481	0	0
Works Manager	31,849	0	0
Rowley Brothers	31,500	0	0
Leslie & Co.	31,499	0	0
A. Hudson & Co.	31,250	0	0
B. E. Nightingale	31,058	0	6
A. E. Symes	31,020	0	0
Gregar & Son*	30,900	0	0
S. E. Moss & Co.	30,780	0	0

* Accepted.

Weston-super-Mare.—For the erection of new department at Locking Road School. Messrs. Hans Price & William Jane, S. J. Wilde & Fry, joint architects, Weston-super-Mare:—

W. Webb, Railway Place, Bath	£3,930	0	0
W. Hopkins, Birmingham	3,700	0	0
H. Pollard, Bridgwater	3,590	0	0
H. A. Forse & Sons, Bristol	3,499	0	0
R. Wilkins & Sons, Bristol	3,443	0	0
J. Long & Sons, Bath	3,444	0	0
C. Taylor, Weston-super-Mare	3,441	0	0
Erwood & Morris, Bath	3,375	0	0
C. & E. Stradling, Weston-super-Mare	3,300	0	0
C. Addicot, Weston-super-Mare	3,284	17	6
Hayward & Wooster, Walcot Street, Bath	3,277	0	0
G. Sprake, Milton, Weston-super-Mare	3,200	0	0
E. Chancellor & Co., Bath	3,189	0	9
E. Walters & Sons, Montpellier, Bristol	3,087	0	0
G. Pollard & Co., Taunton	3,025	0	0
G. & J. E. Stokes, Weston-super-Mare	2,840	17	6
A. J. Culborne,* Swindon	2,729	7	0

* Accepted.

Wrexham.—For the erection and completion of new infirmary buildings, extension of laundry, &c., at Wrexham Workhouse, for the Guardians. Mr. G. Morison, architect, King Street, Wrexham:—

S. Moss, Coedpoeth, near Wrexham	£14,671	11	10
T. Pace, Shrewsbury	13,230	0	0
H. A. Jones	13,080	8	9
W. E. Samuel	12,900	0	0
Davies Brothers	12,837	0	0
J. B. Woolley	12,500	0	0
Lewis Brothers	12,095	0	0
F. Matthews, Nantwich	11,693	0	0
Hughes & Stirling, Bootle, Liverpool	10,772	10	4
Dryland & Preston,* Littleborough, near Manchester	10,469	0	0

* Accepted subject to the approval of the Local Government Board. [Rest of Wrexham.]

Coming Events.

Wednesday, August 16.

INSTITUTE OF SANITARY ENGINEERS.—Examination and Literary Committee at 3.30 p.m. Finance Committee at 5 p.m. Council Meeting at 7 p.m.

New Companies.

W. A. KING & SONS, LTD., builders, contractors, &c., Middlesbrough. Capital: £3,500.

SLAUGHTER & SON, LTD., builders and decorators, Chelsea and Westminster. Capital: £10,000.

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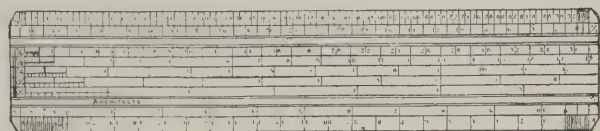
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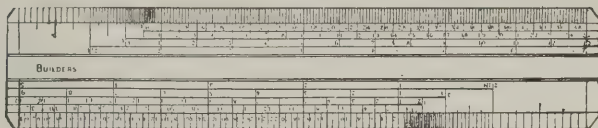
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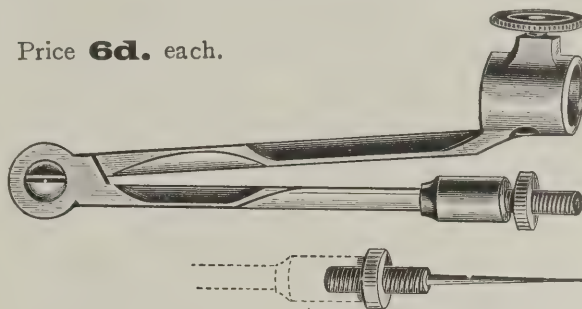
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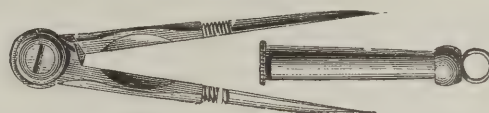
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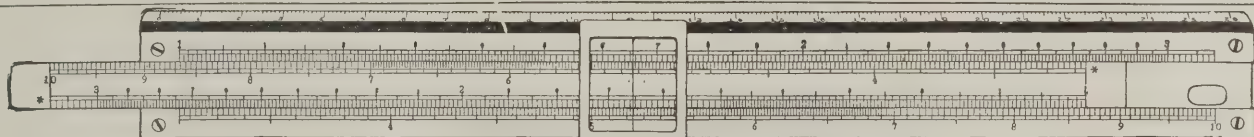


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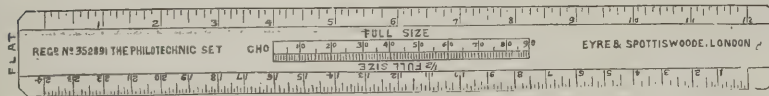
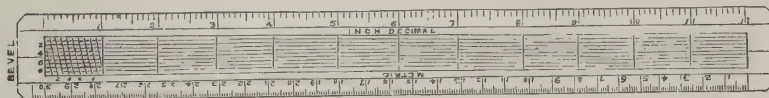
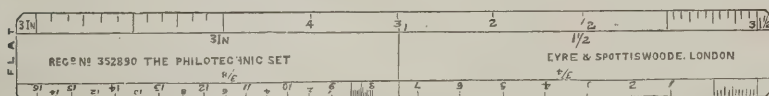
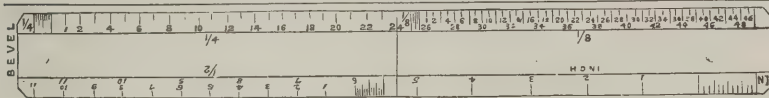


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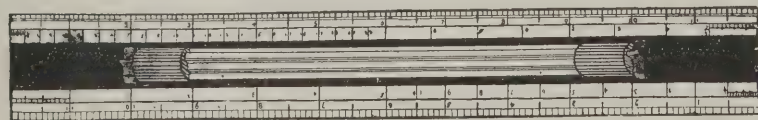
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Petroleum, American ...	per gal.	0	0	5	0	0
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Pitch	per barrel	0	8	0	—	—
Shellac, orange	per cwt.	8	19	0	9	8
Soda, crystals	per ton	3	2	6	3	5
Tallow, Town	per cwt.	1	4	0	—	—
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Do. do. English common brands ...	do.	14	7	6	14	10
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	15	0	0	—	—
Do. pipe	do.	16	0	0	—	—
Nails, cut clasp, 3in. to 6in. ...	do.	9	5	0	—	—
Do. floor brads	do.	9	0	0	—	—
Steel, Staffs, Girders and Angles ...	do.	5	7	6	5	12
Do. do. Mild bars	do.	6	0	0	6	5
Tin, Foreign	do.	150	15	0	151	5
Do. English ingots	do.	149	0	0	151	10
Zinc, sheets, Silesian ...	do.	26	15	0	—	—
Do. do. Vieille Montagne ...	do.	27	0	0	—	—
Do. Spelter	do.	24	0	0	24	15

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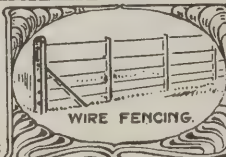
Fir, Dantzic and Memel ...	per load	2	15	0	5	5
Pine, Quebec, Yellow ...	do.	4	0	0	7	10
Do. Pitch, American ...	do.	3	0	0	5	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0
Deals, Sandarne, Yellow, 3rd, 4x9 ...	per std.	12	5	0	—	—
Do. Archangel, Yellow, 3rd, 3x11 ...	do.	8	15	0	—	—
Do. do. do. do. 3x11 ...	do.	8	10	0	8	15
Do. do. do. do. 3x9 ...	do.	9	10	0	9	15
Do. Mesane, Yellow, 3rd, 3x8 ...	do.	0	15	0	—	—
Do. do. do. 4th, 3x9 ...	do.	8	15	0	—	—
Do. Gefle, Yellow, 3rd, 3x9 ...	do.	10	5	0	—	—
Do. Skutskai, Yellow, 1st and 2nd, 3x7 ...	do.	10	15	0	11	0
Do. Räfsö, Yellow, 2nd, 3x7 ...	do.	9	0	0	—	—
Do. do. do. do. 2 1/2 x 7 ...	do.	9	5	0	9	10
Do. Christiansand, Yellow, Unsorted, 3x4 ...	do.	7	15	0	—	—
Do. Skelleftea, Yellow, 1st, 2 1/2 x 7 ...	do.	9	10	0	—	—
Do. do. do. 2nd, 2 1/2 x 7 ...	do.	9	0	0	—	—
Do. Stugsund, Yellow, 4th, 2 1/2 x 7 ...	do.	9	5	0	—	—
Do. Riga, White, Unsorted, 2 1/2 x 7 ...	do.	7	15	0	8	0
Do. Quebec, Spruce, 4th, 3x9 ...	do.	8	0	0	—	—
Battens, all kinds	do.	6	10	0	11	10
Flooring Boards rin. prepared, 1st ...	per square	0	10	3	0	11
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Do. Tobasco	do.	0	0	5	—	—

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T. B. LOXTON, architect and surveyor, Clifton and Bristol. Adj. July 27th.
 J. HUXTABLE, builder, late Bournemouth and Upper Parkstone. R.O. July 26th.
 J. GLADSTONE, builders' merchant, Catford. P.E., Greenwich C.C., Aug. 15th, at 11.
 G. DANSON, builder, Barton-on-Humber. P.E., Great Grimsby Town Hall, Sept. 7th, at 11.
 W. A. FISHER, glazier and painter, Norwich. Adj. July 25th.
 C. BROOK, joiner and decorator, Singley and Wakefield. P.E., Wakefield C.C., Oct. 5th, at 11.
 W. HOOSON, builder and contractor, St. Anne's-on-Sea (late Halifax). R.O. July 28th.
 J. & R. WILLIAMS, builders, Port Talbot (late Aberavon). P.E., Neath Town Hall, Oct. 3rd, at 11.30.
 WALTERS BROTHERS, builders, Leeds. First meeting, O.R.'s, Leeds, Aug. 11th, at 11. P.E., Leeds C.C., Aug. 22nd, at 11.


G. H. BOWLES, surveyor, Kentish Town, Lee and Eltham. P.E., London Bankruptcy Court, Sept. 5th, at 11.
 J. BEANLAND, painter and decorator, Leeds. First meeting, O.R.'s, Leeds, Aug. 10th, at 12. P.E., Leeds C.C., Aug. 22nd, at 11.
 F. COCKROFT, plumber, Bradford. First meeting, O.R.'s, Bradford, Aug. 11th, at 3. P.E., Bradford C.C., Aug. 23rd, at 10.
 E. W. DOLLING, builder and plumber, Gosport. First meeting, O.R.'s, Portsmouth, Aug. 10th, at 4. P.E., Portsmouth C.C., Aug. 28th, at 11.
 E. FARMINER, plumber, Southsea. First meeting, O.R.'s, Portsmouth, Aug. 10th, at 4. P.E., Portsmouth C.C., Aug. 28th, at 11.
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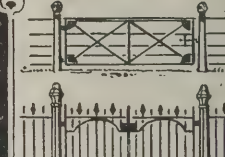
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AND ARCHITECTURAL RECORD.

August 16, 1905. Vol. 22, No. 549.

6, Great New Street, Fetter Lane, E.C.

Summary.

The restoration works at Iona Cathedral have been severely criticized by Mr. A. C. Champneys, who is replied to by Mr. J. Honeyman, the architect responsible for the work. (Page 97.)

The returns in the London Timber Market for July show a rather more satisfactory position as regards the total delivery from the docks and direct from ship to craft if taken together, although the results for the year so far show a deficiency of 6,000 standards compared to those for 1904, and 12,000 standards for 1903. There is no doubt that the condition of the building trade in and around London is responsible for a good deal of this shrinkage in the demand, but to this cause must be added the competition of other avenues of supply outside London, which are restricting the area of delivery from that port to some extent year by year. (Page 92.)

This year's excursion to Lisieux, Normandy, was one of the most delightful of any organized by the Architectural Association. Numerous chateaux and farmhouses in the neighbourhood were visited. The most striking characteristics of these French houses are the fine slate or tile roofs, very steeply pitched, the extensive use of dormers to break up the roof, and walls built of ashlar and brick, often in chequer work or patterned in some way. They belong to the sixteenth and seventeenth centuries. (Page 88.)

Asked whether, in view of the opinion held by competent authorities of the cheap cottages now being exhibited at the Garden City at Letchworth, the Local Government Board would take into consideration the question of further modifying the model by-laws issued for the guidance of district councils, Mr. Gerald Balfour replied that it was, he thought, desirable that in the first instance an officer of the Department should visit the exhibition and report on the subject. (Page 93.)

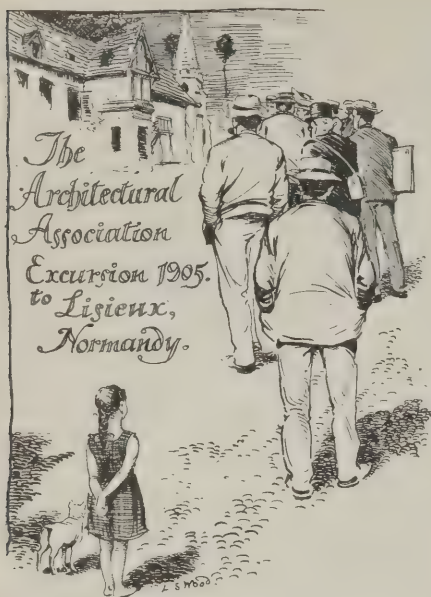
Vanbrugh's style of architecture was only suitable to the largest of buildings, and was even then the occasion of much sarcasm and ridicule from the wits of his day; one of his buildings was likened to a dog-kennel, another to a pie, and a third to a coal scuttle, a flat candlestick, a piece of floorcloth, a snail, a chaise, a tilt in a boat, a house of cards, a mouse trap, and so on. (Page 93.)

One of the Canadian Budget proposals is to raise the tariff on dry white lead from 5 per cent. to 30 per cent., in the interests of British Columbian leadminers and Montreal producers of this commodity. (Page 96.)

A Note on Windows.

It is surprising what little attention is devoted by English architects to the designing of windows in buildings. The lighting of interiors by artificial means has been the subject of numerous papers and discussions, but the lighting of rooms from the exterior by ordinary daylight seems only to attract attention from the point of view of ancient lights. Not only do windows have an important bearing upon the efficiency of a building for the uses to which it is put, and upon the health and physical fitness of the inmates, but the subject is also important on its artistic side, for much of the charm of an interior may be dependent on skilful lighting. On utilitarian grounds the importance of exterior lighting is so great that it is surprising that there has not been a crusade waged in this respect as fiercely as over other subjects affecting the health and livelihood of the community. In the United States a great deal more attention is paid to the matter. It is now beginning to be recognized that the weak eyesight of many persons is due to the bad lighting of school-rooms in which they spent many hours of their childhood. In regard to such buildings regulations have now been made to prevent much mischief in the future, but the small window in many houses undoubtedly contributes in a similar way to defective vision. To secure sunlight in a room during a portion of the day is now recognized as necessary to health. This of course vitally affects the whole planning of the building, the choice of the site and the laying-out of streets; and in so far as the last is concerned the problem should be taken in hand by public authorities. With the exception of shops, where an unreasonable fashion prevails for enormous areas of plate glass, the windows of commercial premises are often too small, and in office premises especially architects neglect to provide sufficient window space. Architects seem to have an objection against ample-sized windows, and there is a good deal of prating about the quality of large unbroken surfaces, but when plenty of light is required the conditions should be frankly accepted, for if modern conditions are to be overridden there can be no advance in architectural art. The tall office building with its small amount of wall surface and multitude of large windows creates a very difficult problem, one which has been taken in hand by American architects and successfully

solved in many cases, leading to an altogether new expression which, although it does not conform to the older canons of proportion, has undoubtedly a beauty of its own. Combined with the problem of providing large windows are a number of other details for affording ready means of keeping windows clean and not obscuring the light, which has a financial value; such are reversible fittings to enable a window to be cleaned from the inside without risking life and limb, and guard rails and platforms on the roofs of buildings to enable skylights to be got at for cleaning. Then there are the various prismatic glasses and mirrors on the market for gathering a greater quantity of light into rooms in confined areas, the means of securing glass in window frames, the composition of the putty, means of excluding rain from penetrating into the interior, and numerous other matters of detail. The colour of glass even is now important in the treatment of certain physical and mental diseases, and this needs consideration in the planning of hospitals especially. In domestic architecture the treatment of windows is often carried to an absurd pitch. Names carry off a great deal of criticism. The architect regards a design by a well-known man in a very different way to the average man, and in this connection the criticism of ladies who know nothing about "who's who" in the architectural world, but nevertheless possess a very keen sense of what they want in a house, is sometimes instructive and amusing in respect of the windows which some architects are fond of providing—squat little windows up at the ceiling, with tiny panes which give no end of trouble in cleaning, and windows sometimes which cannot be got at for cleaning—windows freed from the all-prevalent curtain and consequently not by any means in favour in the eyes of women. Architects need not despise such criticism. Maybe it is not prompted by much professional knowledge, but the old saying of onlookers seeing most of the game has an application here, and we think that the remarks of some of the onlookers as to the feebleness and foolishness of the windows of some houses designed by architects with a touch of the eccentric in them are very much more to the point than the diatribes levelled against the poor householders who are so beneficently allowed to live in such rooms.



By Leonard Sutton Wood.

THIS year's expedition must surely rank among the most delightful of the Association's annual excursions. "The Sunny Land of France" fully justified its name, and the secretaries had arranged a most interesting series of visits to the neighbouring chateaux round Lisieux. Several members of the party managed to put in a few days in advance, and made the journey by road from Le Havre to Lisieux, visiting the quaint old town of Caudebec-en-Caux with its great flamboyant church, curious Renaissance west door and some of the finest old glass left in France, and also Pont Audemer with its unfinished church. Many of these small French towns have magnificent churches only partially finished, the great stone towers often being capped with curious slate roofs in place of the stone spire originally intended. St. Jacques, at Lisieux, and the church at Pont L'Eveque shown in the sketches are examples. The excursion headquarters at Lisieux was the Hotel de France. On Monday, Hermival, Ouilly du Houlay and Fumichon Chateaux were visited.

The most striking characteristics of these French houses are the fine slate or tile roofs, very steeply pitched, the extensive use of dormers to break up the roof and walls built of ashlar and brick, often in chequer work or

patterned in some way. They belong to the sixteenth and seventeenth centuries and consist usually of a main block with other blocks of outbuildings forming a courtyard. Moats still surround most of the houses, showing that the necessity for defence still existed when they were built. Ouilly du Houlay is a good example, and one of the finest we visited. The interior, with massive stone staircases and great well-lit panelled rooms, is also very fine.

On the return on Monday evening the party were received at the Hotel de Ville by the Mayor and Council of Lisieux; the mayor, accompanied by Monsieur Campserveux, the town architect, afterwards showed the party over the new hospital.

On Tuesday the party took train to Pont L'Eveque, a little town about ten miles from Lisieux, which is famous for its particularly rank local cheese. It abounds with delightful old half-timbered houses. Its church, of which a sketch is given, is also interesting. One rather doubts whether the huge bulk of masonry of the tower crowned with simple slate cap could be improved by finishing the stone spire. Inside the peculiar Renaissance bosses to the vaulting are deserving of notice.

There are also two typical old French town houses at Pont L'Eveque, one of which originally belonged to Melle de Montpensier, and the other (now the Sous-Prefecture) was formerly the Hotel de Brilly.

After lunching at the comfortable Lion D'Or with its old-fashioned balconied courtyard, the party drove out to Canapville Manoir, a picturesque farmhouse, the oldest part of which probably dates back as far as the fifteenth century. Then to St. André-D'Hébertot Chateau which there was some difficulty in finding, owing to the incompetence of the driver. The house is beautifully situated in a wooded valley; lit by the last rays of the setting sun, with its white walls reflected in the encircling moat, it formed a striking picture.

On Wednesday the morning was spent in exploring the old streets and houses of Lisieux, for which too little time was given. The famous Salamander House in the Rue au Fevres, and the little museum behind it attracted many, while others visited the cathedral and the curious church of St. Jacques (1496-1540). After lunch the party drove out to the Chateau of St. Pierre Mailloc, where the Count de la Place kindly showed them round the interior. Some of the rooms were hung with magnificent tapestry. Mesnil-Guillaume Chateau, which was visited on the way home, is now uninhabited. The interior contains some delightful woodwork and ironwork.

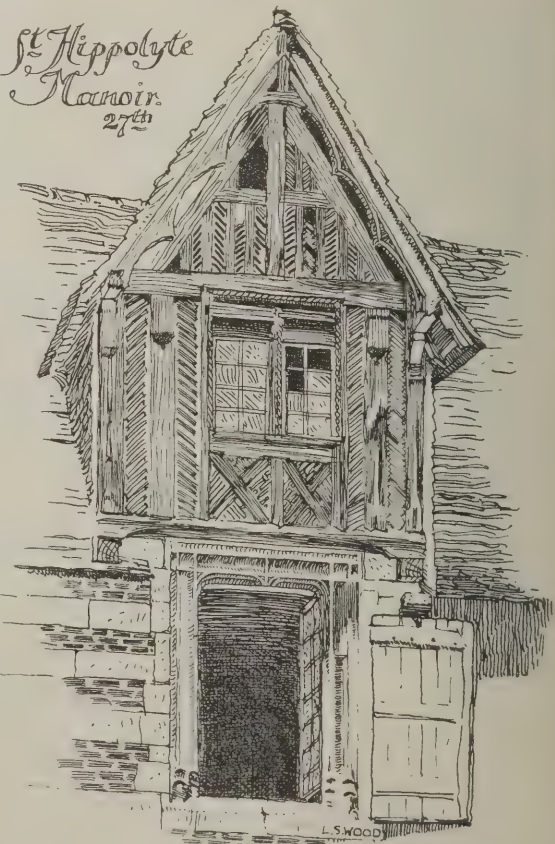
The first of Friday's visits was to a typical old Norman farm just outside Lisieux, known as Defougy Farm. The great stone fireplaces, the old hinges, bolts and latches, and the fine outside stone staircase with its overhanging roof, provided abundant material for notes and sketches. Luncheon was taken at St. Hippolyte Manoir, a picturesque old place, now uninhabited—the case with too many of these old houses. It is well situated on the slope of a wooded hill, at the foot of which runs a small river. The whole front was well worthy of a careful measured drawing, but this being impossible, attention was confined to details, such as the fine dormer windows.



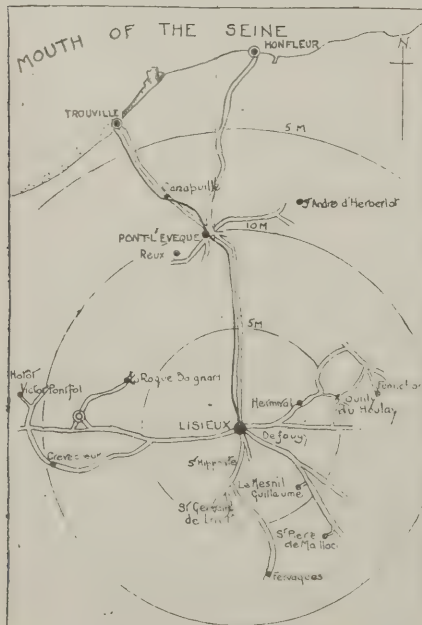
CAUDEBEC-EN-CAUX.

In the afternoon Fervacques was arrived at. Here the Count and Countess de Montgomery were kindness itself in showing the interior and allowing the buildings to be explored. The day closed with a visit to the chateau of St. Germain de Livet, perhaps the most charming of the many delightful places which the president, Mr. Dawber, and Mr. Searles-Wood had found for the party. It is of sixteenth century date, and the gateway towers and front are built in chequers of stone and green glazed brick. One could

St Hippolyte Manoir. 27th



DRAWN BY L. SUTTON WOOD.



MAP OF THE TOUR.

almost imagine it to have been transported bodily from the fairy tales of our early years. In what is now the kitchen are remains of wall decorations in fresco—knights in armour, men-at-arms and pavilions. Here again was tasted the old French hospitality which had been extended to us on most of our visits.

Crêvecœur Manoir, the first on Friday's programme, proved inaccessible to the majority of the party, who contented themselves with viewing it from the road. The few who succeeded in penetrating the wilderness of undergrowth surrounding the remains of the moat, and scaling the walls were not rewarded by any finds of particular interest. An ancient Norman doorway and the great gateway pierced with slits for the archers were noticed. Lunch was taken at Hotot Farm, originally the largest in Normandy, then on to Victot Pontfol Chateau, the owner of which is the only



French member of the Jockey Club, and has an extensive stud. The church adjoining the chateau has an interesting slate spire with dormers. Last came the Chateau de la Roque Baignard. The old sixteenth century gateway tower still retains like many of the other chateaux the vertical slits for the drawbridge chains. The main block is considerably later in date.

Friday evening was devoted to entertaining the mayor and several other guests to dinner at the hotel. Sketches were passed round and criticised, and the evening closed with a pleasant impromptu smoking concert.

On Saturday the party broke up, some returning to Havre *via* Honfleur, where there was time to climb the hill and admire from the Calvary there the magnificent view of sea and sky, with the French Northern Squadron lying at anchor off Havre, dim shapes in the distance. Others—the favoured

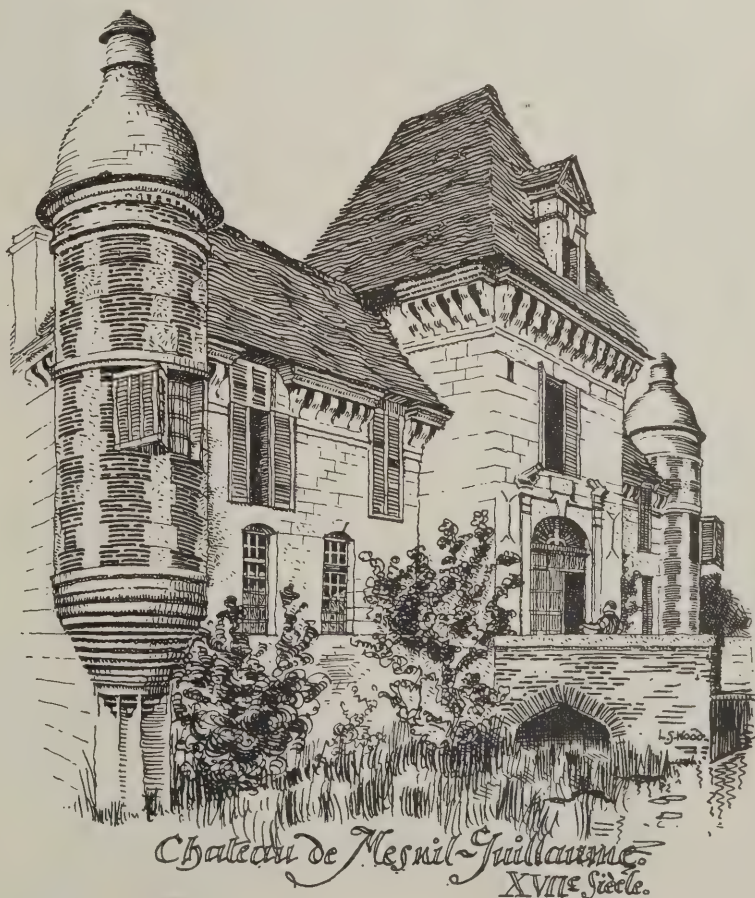


Font Audemer.

DRAWN BY L. SUTTON WOOD.

few—went on to Caen and Falaise. The trip was voted by all to have been one of

the most successful yet organized by the Architectural Association.



*Chateau de Nesnil-Guillaume.
XVII^e Siècle.*

DRAWN BY L. SUTTON WOOD.

Correspondence.

Cheap Cottages Exhibition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—It appears that one of your correspondents thinks that my cottages at Letchworth do not look as cheap as he thinks they ought to look. I may be mistaken, but I really never supposed that the purpose of the exhibition at Letchworth was to produce cottages to look cheap, and I am very pleased to hear that to the casual observer my contribution appears worth from £700 to £1,000.

I say "casual observer," because a more discerning eye might perhaps have detected, for instance, that the chimney which has so many more corners than a chimney ought to have is not rough-casted, as he states, at all! A little reflection might have revealed the remote possibility that old tiles are not necessarily more expensive than new ones, and indeed are sometimes very much cheaper, and that a single-storey scullery with its special facility for ventilation is not necessarily expensive.

Your correspondent also seems annoyed because the metal-work is "purpose made," and makes various unfounded statements and unnecessary comparisons which I do not propose to discuss. An anonymous writer of this class, who is so blinded by prejudice that he sees rough-cast where there is nothing but brickwork, whose notion of architectural criticism is to count the angles of a chimney, whose notion of the English language involves the use of a barbarous trade jargon, and who makes unfounded statements with no other basis but his own incompetent observation, might have been disregarded were it not that unfuted charges are too often assumed to be proved. I have no reason for doubting Mr. Charles Negus, of Bedford, the builder of the cottages, when he assures me that the work has been done within the limits required by the competition; and it is at least some satisfaction to learn that the cottages convey an impression of costliness far above their actual price.—Yours truly, BAILLIE SCOTT.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The conclusion of the article in THE BUILDERS' JOURNAL on the above exhibition seems to largely consist of a complaint that the exhibitors have considered the conditions of competition more important than the ideas—expressed "at the time"—of the writer of the articles.

Assuming that the competitors have complied with those conditions (and whether they have or have not done so would appear to be a matter entirely between themselves and the judges), it is approaching impertinence to charge them with "self-advertise-

ment" and "misrepresentation" simply because in most cases the total costs exceed by £30 or £50 the nett amounts fixed in the respective classes. The conditions did not state any desire on the part of the committee that competitors should keep the costs much below the limits stated; the competitors consequently would not see any advantage in building cottages in accordance with the ideas of any unconcerned persons with views on the subject.

May we point out that the competitors are not responsible for the unqualified terms "£150 cottage" and "£210 cottage," though these are not misleading to anyone who is at all interested in and conversant with the exhibition.

The remarks about the cost of concrete construction seem to be part of the "nonsense about new materials and methods." We know at least one form of concrete construction in use at the exhibition which works out at considerably less than the cost of brickwork.

A correspondent who hides his identity behind the letter "X." is also responsible for some original comparison. It certainly seems other than accidental that he should ignore the difference between contract and cost

prices. His idea of £700 or £1,000 as the cost of the cottages he mentions seems to indicate that his notions of the cost of building would be well represented by his pseudonym. Is not such a valuation a strain on "the credulity of the profession"?

Perhaps "X." will be good enough to explain what he means by rough-cast angles to a chimney stack. We have not noticed any rough-cast at all on those at Mr. Baillie Scott's cottages.

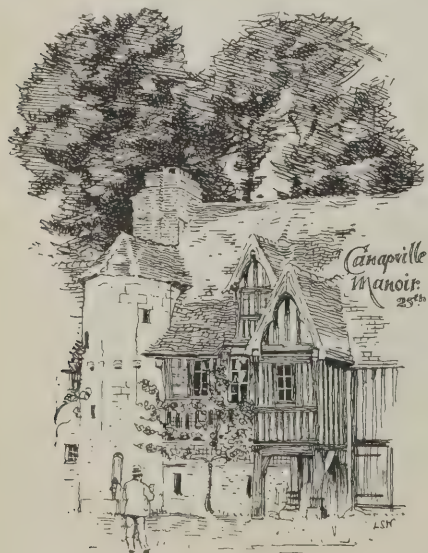
Surely the last suggestion is not meant to be taken seriously. It implies both a lack of confidence in the judges and a desire to enquire into a matter in which the public have no concern.—Yours truly,

ROBERT BENNETT, A.R.I.B.A., and
WILSON BIDWELL.

[The competition was promoted with the avowed object of solving the problem of housing the agricultural labourer, and the public (from whom contributions were solicited, although our correspondents think it is unconcerned) had a right to expect the competitors to direct themselves to this and not to the winning of prizes by sticking to the letter of conditions, although these, badly drawn as they were, expressly stated the primary object of the exhibition to be



THE CHURCH, CAUDEBEC-EN-CAUX. DRAWN BY L. SUTTON WOOD.



*Le Chateau de Saint-Germain de Livet.
XIII^e siècle.*

DRAWN BY L. SUTTON WOOD.

are now adding a small percentage of moisture during the grinding process in place of gypsum. This moisture, added in the form of steam, after hydrating any free lime present, hydrates the uncombined aluminates of lime, to which the quick setting of cement is attributed.

If your correspondent "A. H." uses finely-ground and well aerated cement the expansion in his floors is probable due to the fact that concrete, like almost every other building material, expands and contracts with variations of temperature, concrete having the same coefficient of expansion as wrought-iron. In floors of large area, and in fact in all concrete floors, expansion joints should always be left, or trouble will result.

When will engineers and architects refrain from using that very doubtful concrete aggregate—coke-breeze? It has nothing whatever to recommend it except its lightness, and it is certainly not fireproof. One of the finest aggregates for cement-concrete is almost entirely ignored in this country, although extensively used in America. I refer to hard limestone, which on account of its porosity enables the cement to adhere to it more firmly than to any other aggregate I have used, and is almost as hard as granite.

—Yours truly,

W. A. T. FLITTON.

WELLINGBOROUGH.

"to secure the erection of the best £150 cottage." The request for the cost exclusive of the carriage of materials and architect's and builder's fees does not alter the plain meaning of the words. We are quite ready to believe that many "interested in and conversant with the exhibition" were not misled, though the public has been. We can only assume our correspondents have misread our remarks, for we made no charge of self-advertisement and misrepresentation against all and sundry because the stated actual costs exceeded the limits by 15 per cent. or 20 per cent.—ED. B.J.]

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I have been interested in the notices and plans of the cottages at Letchworth recently published in your Journal. The subject is especially interesting to land-owners and their agents. We find it impossible to build good new labourers' cottages for £300 a pair giving sufficient accommodation even in villages where we are not bound by stringent by-laws. We are now building some that will cost very close on £400 the pair—nothing very original about them, but the haulage of materials is an important factor of the cost in the country. Some estimates for the same cottages ran as high as £600.—Yours truly,

J. E. BATCHELOR.

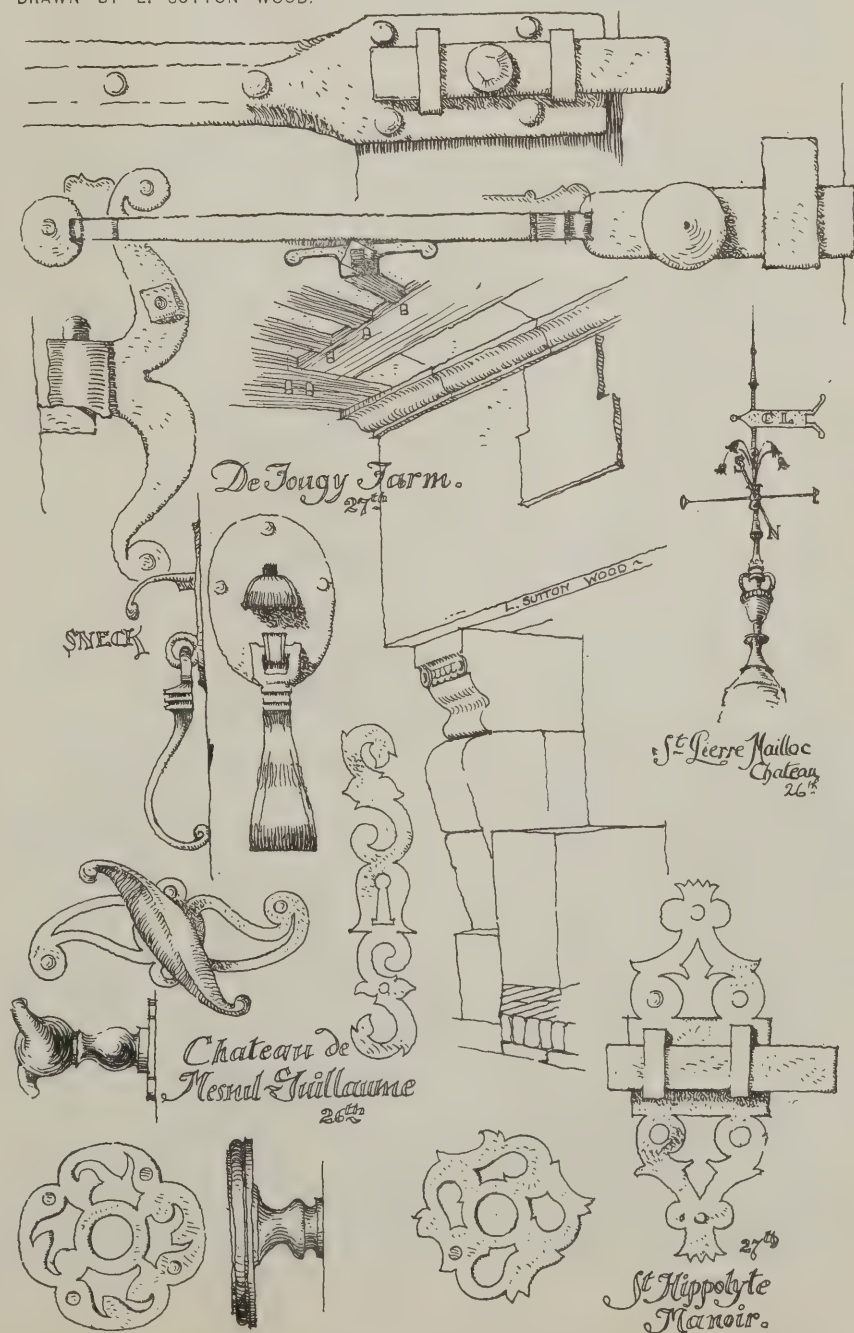
DIGBY ESTATE OFFICE, SHERBORNE.

Expansion in Concrete Floors.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Referring to the correspondence in your columns on this subject, the use of a small quantity of gypsum to regulate the setting of cement can have no deleterious effects. It is a convenient method of introducing a small quantity of sulphuric acid into the cement, and is added during the grinding process. The addition of this minute quantity of sulphuric acid defers the setting of the cement, and by allowing the water with which the concrete is mixed to act on the cement for a longer period before the setting takes place it must tend to lessen the danger from free lime. Your correspondent "A. H." mentions 2 per cent. as the quantity of gypsum used, but this is the maximum amount allowed by the Standard Cement Specification, and I very much question if any cement manufacturer finds it necessary to use more than 1 per cent.: in most cases 0.5 per cent. is quite sufficient.

In order to meet the views of those engineers who are prejudiced against the use of gypsum a good many manufacturers



THE TIMBER TRADE.

London Market in July.

The stock of wood in the public docks on July 31st was—

	Pieces.
Foreign deals and ends - - -	1,550,000
Do. battens - - -	1,925,000
Pine deals and battens - - -	871,000
Spruce do. do. - - -	699,000
Boards, rough - - -	3,582,000
Do. prepared - - -	6,080,000

Totalling 14,707,000 pieces, as compared with 17,004,000 in 1904, 17,129,000 in 1903, and 20,439,000 in 1902.

In other kinds the stock was as follows:—

Foreign wainscot logs - - -	143 pieces.
Do. oak timber - - -	1,001 loads.
Do. fir timber - - -	634 do.
Do. Oregon pine, &c., spars and masts - - -	3,857 do.
Colonial oak timber - - -	1,301 loads.
Do. birch timber and planks - - -	3,040 do.
Do. elm and ash timber - - -	733 do.
Do. yellow pine - - -	726 do.
Do. red pine - - -	150 do.
United States pitch-pine timber - - -	15,265 do.
Do. do. deals - - -	40,000 pieces.
East India teak - - -	6,978 loads.

The deliveries for the first seven months have been of—

	Pieces.
Foreign deals and ends - - -	1,838,000
Do. battens - - -	3,464,000
Pine deals and battens - - -	642,000
Spruce do. do. - - -	882,000
Boards, rough - - -	3,204,000
Do. prepared - - -	9,041,000

Totalling 19,071,000 pieces, as compared with 20,826,000 in 1904, 22,367,000 in 1903, and 22,960,000 in 1902.

The deliveries for July

were as follows:—

	Pieces.
Foreign deals and ends - - -	250,000
Do. battens - - -	483,000
Pine deals and battens - - -	90,000
Spruce do. do. - - -	101,000
Boards, rough - - -	331,000
Do. prepared - - -	1,359,000

Totalling 2,614,000 pieces, as compared with 2,626,000 in 1904, 3,257,000 in 1903, and 2,982,000 in 1902.

Deliveries from Ship to Craft.

The deliveries direct from ship to craft for the first six months of the year have been:—

	1905.	1904.	1903.	1902.
	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens - - -	63,830	60,474	55,210	50,779
Boards - - -	13,282	10,975	13,606	14,168
Total - - -	77,112	71,449	68,816	64,947

and for July—

	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens - - -	30,203	27,309	20,272	19,909
Boards - - -	3,543	3,619	1,869	2,716
Total - - -	33,746	30,928	22,141	22,625

The above returns show a rather more satisfactory position as regards the total delivery from the docks and direct from ship to craft if taken together, although the results for the year so far show a deficiency of 6,000 standards compared to those for 1904, and 12,000 standards for 1903. There is no doubt that the condition of the building trade in and around London is responsible for a good deal of this shrinkage in the demand, but to this cause must be added the competition of other avenues of supply

outside London, which are restricting the area of delivery from that port to some extent year by year. No great progress has been possible during the month with free on board business except in retail quantities, owing partly to the fact that Swedish shippers are inclined to hold for rather more remunerative prices for autumn supplies, which buyers all over the country do not find the state of the demand warrant them in paying. On the whole the future looks slightly more hopeful, as stocks abroad are certainly not excessive, in the smaller sizes and floorings especially. Freight remain easy, and there is no scarcity of tonnage, but only a scarcity of demand for it.

Soft Woods.

Sweden.—Messrs Churchill & Sim state that battens continue to be sparingly imported, and prices are, on the whole, a little better. The demand for prepared boards, especially in the narrower sizes, has continued, with here and there an improvement in prices. Deals continue to be neglected, and any pressure to sell wholesale quantities results disastrously to the importers.

Norway.—The importation has been on a very light scale, and prices are a shade harder in consequence. A more hopeful feeling seems to exist in the producing countries as regards the future of the flooring market, which is reflected in the higher prices now being asked for autumn shipments, and in the absence of any large additions to the stock here during the month.

Russia.—There is no improvement in the demand for Russian deals in this market, and very low prices have had to be submitted to where large lines of stock have been in hand. Some little progress has been possible with the realisation of shippers' stocks for early autumn delivery, but only at the lowest current prices and for attractive specifications.

Finland.—Prices for battens are inclined to harden during the month owing to the light stock and the rather better demand for them.

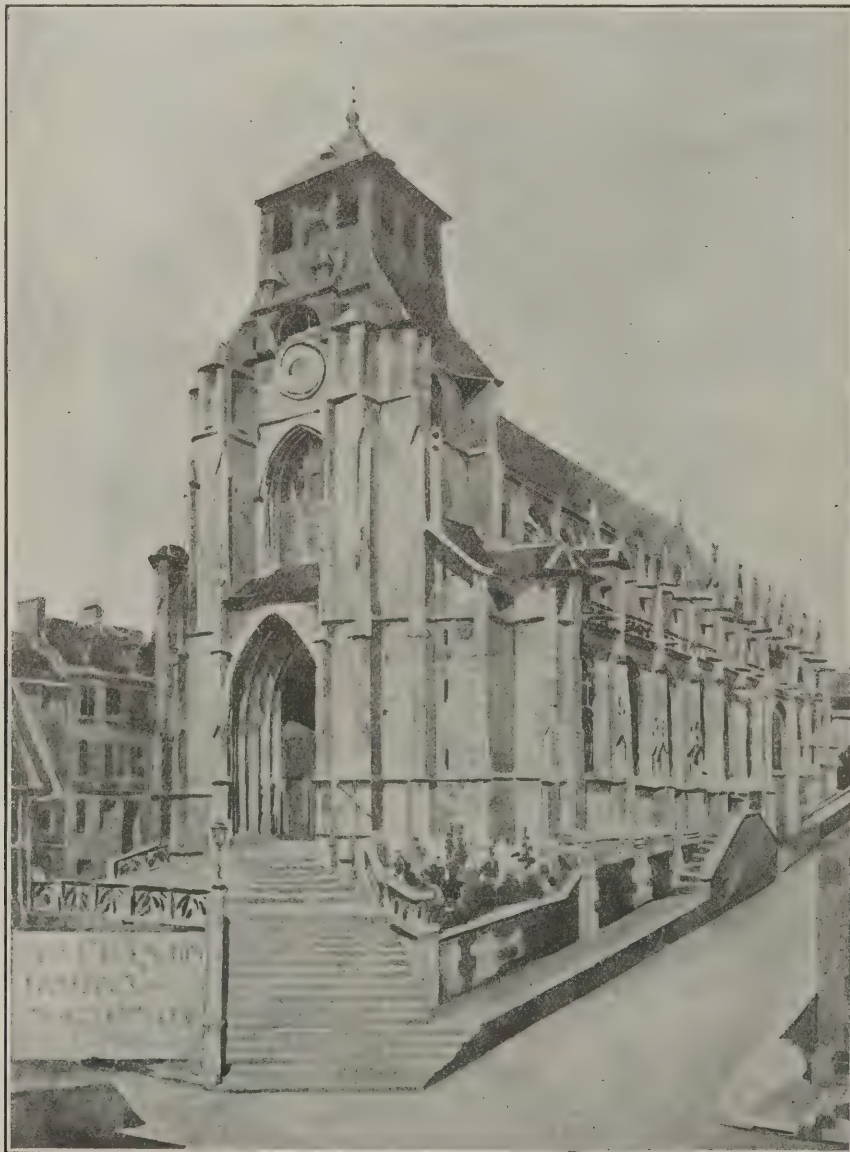
Prussia.—There is no longer any wholesale demand for fir timber in London, but for special orders prices are quite firm.

Canada.—Although the supply of pine deals has been on a very small scale, prices do not seem to be affected to any extent, owing to the wretched state of the demand. Spruce has come forward rather more freely during July, but business continues difficult owing to the divergent views of sellers and buyers. Any improvement in the demand for spruce would quickly remove this barrier, but at present there is a feeling of indifference prevalent among buyers who believe that they will always be able to pick up what stock they require when it suits them to come into the market. In this they may be disappointed. The demand for sawn timber has been better—in the larger sizes especially. Quotations for forward delivery are quite firm and somewhat inclined to harden, and the stock here, even with some additions to it during July is in small compass. Deals have been imported to a smaller extent than usual and, with the stock very much reduced and expensive to replace, holders are expecting higher values.

Hardwoods.

Mahogany.—The arrivals last month were exceptionally light, and although the sales were not large the quantity sold was not replaced by fresh arrivals. The deliveries from the docks continue satisfactory and the stocks here are becoming seriously depleted. The demand at the auctions has been good, and prices generally have an upward tendency, which an improvement in trade would soon accelerate.

Queensbury's New Public Cemetery has been completed at a cost of £5,500. Mr. E. B. Drake was the architect.



ST. JACQUES LISIEUX. DRAWN BY ERNEST G. THEAKSTON.

IN PARLIAMENT.

(By Our Press Gallery Representative.)

The Cornwall Monument.

THE subject of the proposed removal of the Cornwall monument in Westminster Abbey and its re-erection in part in another place was again discussed in the House of Lords on August 1st.

Lord Hawkesbury and Earl Spencer renewed their protestations against interfering with the monument in the manner proposed, and Lord Ellenborough remarked that when he entered the Abbey his artistic sense was submerged by his historical recollections.

The Marquis of Lansdowne replying for the Government said his own impression was that the proposal of the Dean and Chapter dealt somewhat over severely with the Cornwall monument. It involved a complete disturbance of the principal parts of the monument, which was to be re-erected in a position where it would be impossible to decipher the inscription. He suggested that there should be some further discussion between those interested in the matter and the Dean and Chapter as to the manner in which the monument should be dealt with. He proposed that there should be a conference between Lord Hawkesbury, Lord Windsor (the First Commissioner of Works) the Dean of Westminster and perhaps one of the Cornwall family, when it might be possible to come to some wise decision. On this understanding Lord Hawkesbury withdrew the motion he had proposed, that the Cornwall Monument ought not to be removed without due notice being given to Parliament.

Poulduff Pier.

Mr. Long on July 27th informed Sir Thomas Esmonde that the contract for the construction of Poulduff Pier, in County Wexford, had not yet been signed. The Department were in communication with the contractor on the subject.

Cheap Cottages.

Mr. Noel Buxton asked the President of the Local Government Board whether in view of the favourable opinion held by competent authorities of the cheap cottages now being exhibited at the Garden City at Letchworth he would take into consideration the question of further modifying the model by-laws issued for the guidance of district councils.

Mr. Gerald Balfour replied that it was, he thought, desirable that in the first instance an officer of the Department should visit the exhibition and report on the subject, and arrangements were being made for this purpose.

Public Works in Ireland.

Mr. Long informed Mr. Dillon that the total amount of the substituted grant for school buildings in Ireland was £210,000 consisting of £140,000 to be voted by Parliament for public funds and £70,000 to be voted from the Ireland Development Grant. This amount would be spent in six years or more as might be arranged.

Mr. Long also stated in reply to Mr. Dillon that the amount proposed to be spent on the new residences for the students of the Marlborough Street Training College, Dublin, could not at present be stated. The new buildings when completed would provide accommodation for both male and female students, but tenders had as yet only been invited for the residence for the male King's scholars. As the terms for the contract had not been finally settled the amount of the tender could not be made public. The plans of the new buildings were submitted to and approved by the whole body of Commissioners.

Alterations at the House of Commons.

Lord Balcarras answering Mr. Renwick stated that the First Commissioner of Works

feared that structural difficulties would prevent the widening of the staircases leading from the Strangers' Smoke Room and the Terrace to the Lobbies of the House of Commons.

AN ECCENTRIC ARCHITECT.

Sir John Vanbrugh and his Work.

SIR JOHN VANBRUGH, the eminent but eccentric architect and dramatist, formed the subject of an interesting paper read by Mr. F. W. Nunn, of Lee, at a recent meeting of the Woolwich Antiquarian Society. Additional interest was lent to the paper by the fact that the meeting was held at Vanbrugh Castle, on Maze Hill, Greenwich, or as it was formerly called Bastille House, or the Bastille, it being said that it was built by Vanbrugh in resemblance of a portion of the Bastille, which was demolished in July, 1789, and in which Vanbrugh himself, when a young man, is said to have been once confined for about ten months. Mr. Nunn mentioned the fact that it was the custom in Vanbrugh's time for the architect to employ such workmen as he thought fitted for the job, to pay them himself, and call on his employers from time to time for money as it was required. As Vanbrugh was building this for himself he would naturally give it his best attention, and the other buildings close by, erected at the same time (A.D. 1717), doubtless grew up under Vanbrugh's immediate and continuous superintendence. Mr. Gilbert H. Lovegrove, in a prize essay to the Architectural Association, stated that Vanbrugh Castle was built of stock bricks, ornamented solely by key-stones, imposts, corbel-tables and string courses in projecting brickwork, the whole somewhat resembling a fortification, a conception carried still further by the crenelated or embattled wall which surrounds the garden and the turretted gateway. This picturesque old gateway, with its square turret on either side, was removed about a year ago for the purpose of widening the road, the frontage line being now set back. The staircase, as was frequent in Vanbrugh's designs, formed a prominent member of the main front, although it became as a consequence dark and inconvenient. By another staircase one reached the roof, from whence was obtained a beautiful view over London. Vanbrugh House, which stood on the opposite side of the road, a little to the left, and nearer Westcombe Park, was demolished about two years ago. It was an immense rectangular building, also of stock brick, with a circular tower at each end. Internally there was a long dark central passage opening into rooms on each side. The hearths were of marble, and the chimney-pieces were well carved in wood to simple designs.

The Mince Pie House, now known as Sherwood, still remains. It was one of the smallest of Vanbrugh's houses. The entire building is on the ground floor, and, beside containing several rooms of larger size and better proportions than the other houses, is much more comfortably planned.

Vanbrugh's Style.

Vanbrugh's style of architecture was only suitable to the largest of buildings, and was even then the occasion of much sarcasm and ridicule from the wits of his day; one of his buildings was likened to a dog-kennel, another to a pie, and a third to a coal scuttle, a flat candlestick, a piece of floorcloth, a snail, a chaise, a tilt in a boat, a house of cards, a mouse trap, and so on. This was doubtless the cause of the name Mince Pie House, just as the house which he erected from the ruins of the palace at Whitehall, in which he died in 1726, came to be known as "the Goose-Pie House" through Dean Swift, who seems to have observed it during

the course of its erection, as he wrote in derision:—

"At length they in the ruins spy
A thing resembling a goose pie."

That building thus obtained and retained the name of "The Goose-Pie House"; but in its declining days it was known as "the Pill-Box." Voltaire, who stayed three years in England, had knowledge of some of Vanbrugh's buildings, for he wrote that "They would be more comfortable if Vanbrugh had made the rooms as wide as the walls were thick." Sir Joshua Reynolds, the great portrait painter, was one of the few who appreciated Vanbrugh's originality of invention. He writes that "In the buildings of Vanbrugh there is a greater display of imagination than we find in any other, and this is the ground of the effect which we feel in many of his works." Had Vanbrugh received a more sound architectural education the probability is that his name would have occupied a more prominent position in the temple of fame.

His Chief Works.

The first notice of Vanbrugh as an architect was in 1701, when he furnished the design for Castle Howard for the Earl of Carlisle, who appeared to have been his first employer of note. Castle Howard, with its south facade 323ft. long, is said to be one of the finest examples of the Corinthian renaissance in England. The main building was not completed till 1714, but in 1704 the Earl of Carlisle, the then acting Earl Marshal of England, in appreciation of Vanbrugh's work, obtained for him the lucrative appointment of Clarenceux King-at-Arms. In 1703 Vanbrugh bought land in the Haymarket and built a theatre there called the Queen, in honour of Queen Anne. In 1702 Vanbrugh was appointed Comptroller of the Board of Works, which had as its surveyor general the great Sir Christopher Wren. In 1705 Vanbrugh was appointed architect and surveyor, by the Duke of Marlborough, of the palace it was proposed to erect at Woodstock in commemoration of the victory of Blenheim, which is probably the largest domestic building in England, with a frontage 348ft., a library 183ft. long and a hall 67ft. high. In 1716 he was appointed architect to Greenwich Hospital at a salary of £200 per annum, and he is said to have designed the centre of the more southern range of the west front (King William's block) in red brick with stone dressings, and some of the external decorations of the Painted Hall are attributed to him. Vanbrugh Castle, Vanbrugh House and the Mince Pie House, as we have seen, were built in 1717. Sir John's chief architectural works numbered some forty-two, all curious and many of them great massive buildings, many now disappeared.

Competitions.

The Competition Reform Society disapprove of the conditions of the competition for the town hall, &c., at Dartmouth (to which we drew attention in our issue for last week) and are endeavouring to obtain a revision of the same.

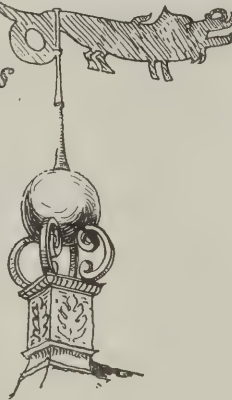
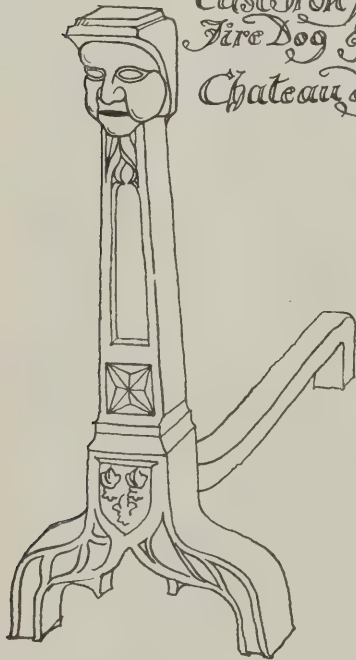
Consett Baptist Church and Schools.—The design submitted in a recent competition by Messrs. George Baines & Son, 5, Clement's Inn, Strand, London, for the new Baptist church and schools at Consett, co. Durham, has been adopted.

Mitchell Library, Glasgow.—The premiums have now been allotted to the architects who competed for the new Mitchell library at Glasgow but were unsuccessful in having their plans adopted. The first premium of £100 goes to Mr. Arthur, of Glasgow; £75 to Mr. Greenslade, of London; and £50 to Mr. Rhynd, of Glasgow.



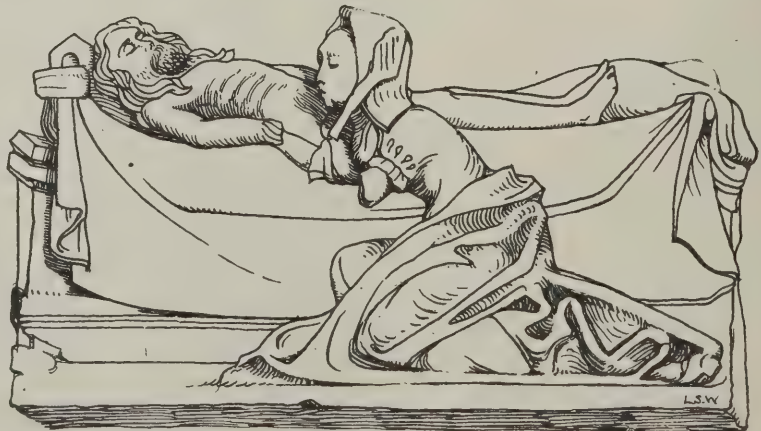
C.S. Wood.

Cast Iron Fire Back
Fire Dog & Vane.
Chateau de Jervagues



Lisieux 29th

IN THE MUSEUM.

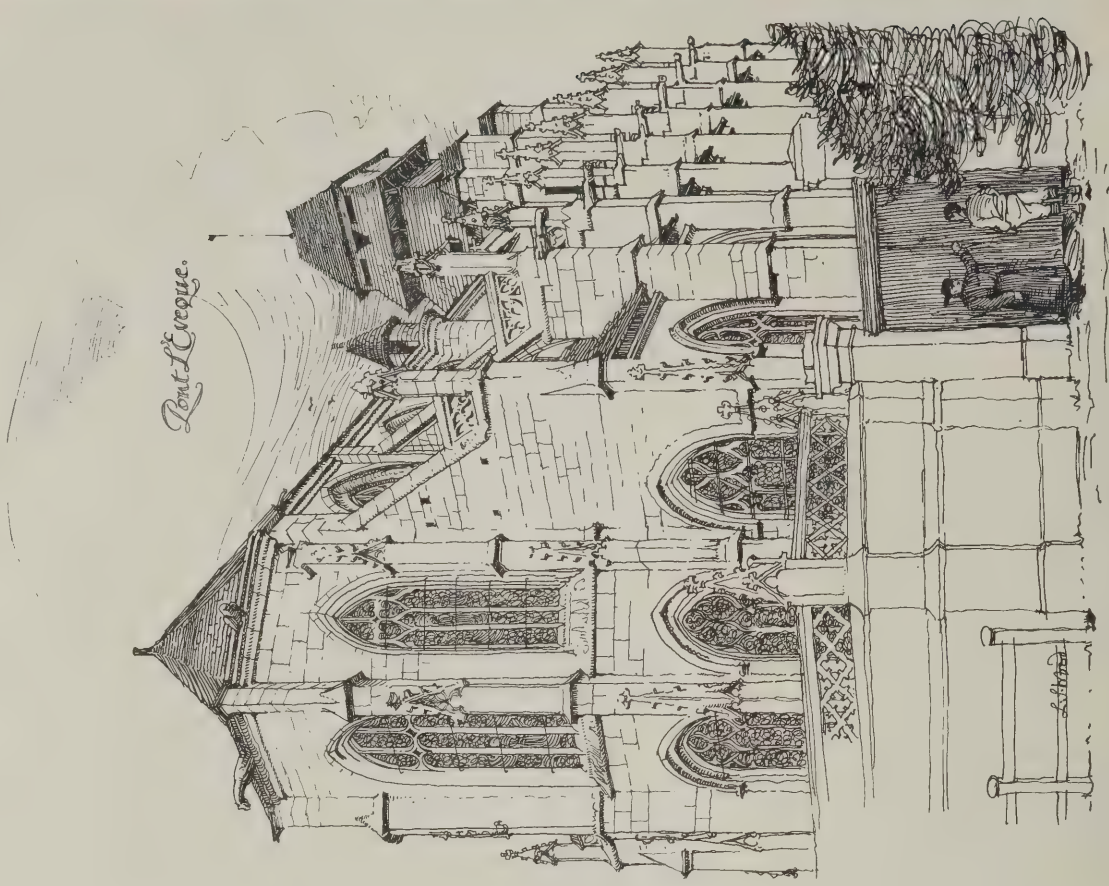


IN THE MUSEUM, LISIEUX.

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*Chateau de
Annickon
27th Aug 1905*

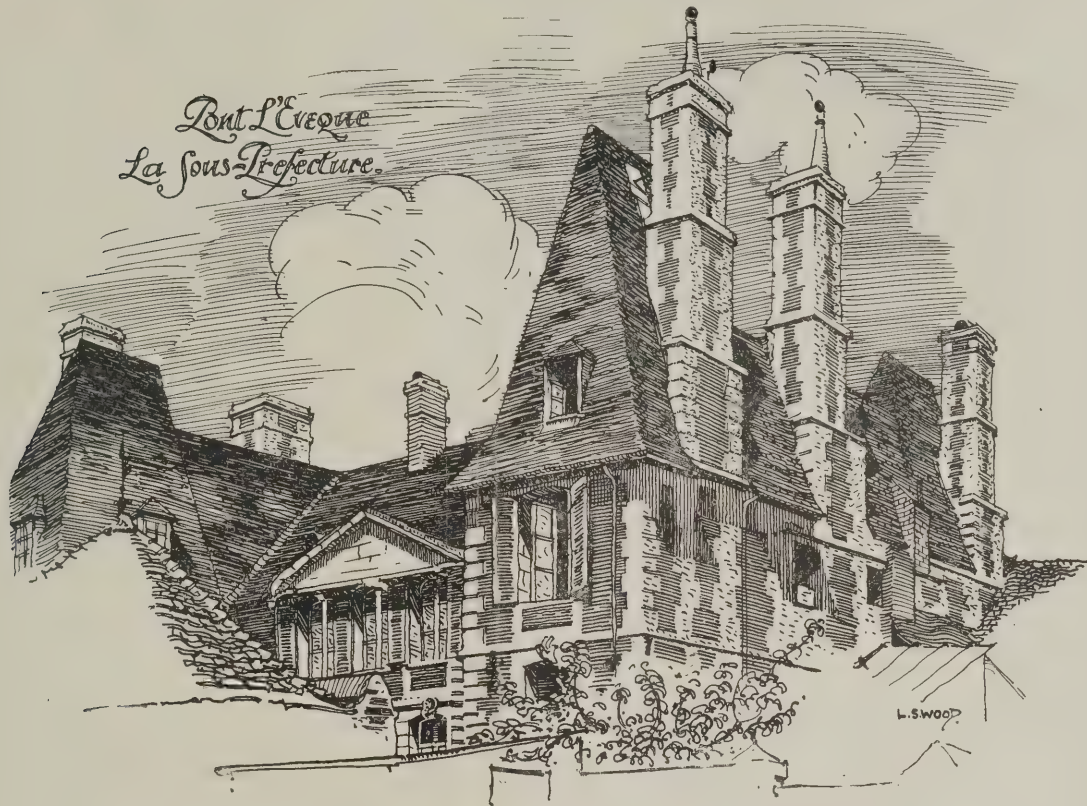


Pont L'Eveque.



DRAWN BY L. SUTTON WOOD.

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Keystones.

Mr. James Miller, architect, Glasgow, is to submit plans for a new hydropathic at Peebles, to replace that burnt down.

Mile End Workhouse Extension was opened recently. Accommodation has been provided for 220 persons at a total cost of £12,396.

Mr. H. L. Mercer, architect, Ayr, has been appointed to complete the work of the South Parish Hall, Girvan, in place of the late Mr. Kerr.

Barking Baptist Tabernacle is being entirely remodelled internally, and galleries are being introduced. The contract is let to Messrs. Sands & Burley, of Walthamstow, at £1,744. Messrs. George Baines & Son, 5, Clement's Inn, Strand, W.C., are the architects.

Collapse of a Skyscraper.—The great stores at Albany (N.Y.) belonging to Messrs. Meyers suddenly collapsed on Tuesday last week and buried about 100 of the employees in the ruins. Framework, walls, stanchions—every portion of the skyscraper fell in utter ruin.

Change of Address.—Mr. Norman Evill has removed from 124, Regent Street, W. (office) and 39, Upper Gloucester Place, Dorset Square (private address) to 10, Davies Street, Berkeley Square (office and private address). His telephone number is 4182 Gerrard.

A new Railway Bridge at Norwich has been substituted for the old one spanning the River Yare. It is of double cantilever type, 122ft. long, with two viaduct spans, and will be electrically operated from a powerhouse on its centre. The new structure was placed in position in thirty-three hours.

The new Bridge over the Irwell between Manchester and Salford has cost £12,500. It consists of two Linville truss girders, each 18ft. deep and a little over 167ft. long. Each of the girders weighs about 140 tons and rests upon the old stone abutments. The total weight of the steelwork of the bridge is about 560 tons. The plans and estimates were prepared by the Manchester city surveyor, and the work has been carried out by Messrs. Morton & Co., of Garston.

An Infectious Diseases Hospital at Stricken was opened recently. It consists of five blocks and cost £17,000. The buildings are erected with rubble got in the vicinity, with dressings from New Pitsligo. Mr. Ironsides was the architect, and the contractors were:—Masons, George Cooper & Son, Boyndlie, Fraserburgh; carpenters, Edwards & Rae, Dyce; slaters, McIntosh & Connon, Peterhead; plasterers, James Scott & Son, Aberdeen; plumber, William Leask, Alford; painter and glazier, J. A. Ogilvie, New Pitsligo.

The Manchester Society of Architects paid a three days' visit from August 4th to 7th to study the charming stone buildings of the Cotswold district. Chipping Campden, probably the most interesting of a group of beautiful villages, was chosen for the headquarters, and provided ample material for study. Unfortunately, heavy rain restricted the choice of subjects for sketching to those where some shelter could be obtained; this made the sedilia in the church particularly valuable, while the quaint market hall afforded a refuge from the rain with a picturesque outlook. The workshops of the guild of handicraft were examined with interest. Sunday, the one fine day, was pleasantly spent in walking to Broadway, almost equal to Campden in its wealth of architectural interest. The Society has also made visits to Messrs. De Bergue & Co.'s ironworks and to the new Manchester fire-station (Messrs. Woodhouse, Willoughby & Langham, architects).

An Isolation Hospital at Preston is being erected at a cost of £20,000. Provision will be made for fifty-six beds.

The Tower of St. Mary's Church, Oatlands Park, has now been completed, the work having occupied nearly eighteen months. It was carried out by Messrs. Goddard, of Farnham and Dorking, from the designs of Mr. J. Compton Hall, F.R.I.B.A.

A Memorial Mission Church at St. Ives has been erected from designs by Mr. E. Sedding, of Plymouth, at a cost of about £1,600. It is 89ft. long, the nave being 25ft. wide. Granite has been used throughout, with ashlar stonework from the Polyphant quarries, near Launceston.

Mr. A. B. Skinner has been appointed Director of the Art Museum at South Kensington, to succeed Sir Caspar Purdon Clarke. Mr. Skinner has been a member of the staff of the Victoria and Albert Museum since 1879, and assistant director of the Art Museum since June, 1896.

Open-air Public Baths at St. Albans have been provided. The city surveyor prepared the plans, and the work was carried out by Mr. J. T. Bushell at a cost of £1,275. The swimming bath is 105ft. by 30ft. with a depth of 6ft. at one end and 3ft. 6ins. at the other. It is constructed of Portland cement concrete, walls 2ft. thick and the bottom 1ft. thick, the whole being rendered in cement and finished smooth. The footpaths around the bath, 10ft. wide at the sides and 12ft. at each end, are laid with Imperial stone flags, the whole being surrounded with a 14in. brick wall 8ft. high.

Alterations at Winchester College are to be made, including the conversion of the college brewery into an adjunct of the warden's lodgings. Writing to the "Times" in reference to the proposal, "A Wykehamist" says: "The characteristic of Wykeham's buildings at Winchester which has most impressed those who have critically examined them, or have lived in them and loved them, is not their beauty of detail; it is rather the sincerity and austere dignity of their design, and the perfect arrangement of their ensemble. Wykeham had no idea of treating meanly, or of hiding from view, what was practical, workaday, domestic; the offices of his college were placed, plain and effective, in his 'outer court,' through which all who entered the college passed. What we consider the uncomely parts of an establishment and conceal he forces on our notice, and we recognize their abundant comeliness. It appears that the governing body of the college has determined to alter the whole character of this outer court. The brewery, which occupies its north side, is to be turned into an adjunct of the warden's lodgings, and provided, I presume, with ornate windows and such other embellishments as a clever modern architect may devise. The need for additional accommodation may conceivably be so pressing as to justify all this; but the office of resident warden has recently been abolished; and *prima facie* the need for accommodation has diminished."

Obituary.

Mr. George C. Porter, aged 55 years, master-builder, of Hornsey, committed suicide recently by taking carbolic acid.

Mr. William Allan, retired builder, of 34, West High Street, Inverurie, died recently, aged 68 years. An architect of considerable standing, the deceased was very frequently employed in this capacity, and many of the best buildings in Inverurie and neighbourhood remain as evidence of his ability and worth.

Builders' Notes.

The Venezuelan Federal Court has decided to annul the charter of the Bermudex Asphalt Co.

The Holmes Chapel Schools have been supplied by Messrs. E. H. Shorland & Brother, of Manchester, with their patent Manchester stoves.

Rural By-Laws: An Alteration.—The Cuckfield (Sussex) District Council has decided to alter its by-laws so as to allow of the building of rural cottages similar to those exhibited at Letchworth Garden City.

At a Master-Builders' Banquet at Pretoria recently Mr. Ashdowne made the remarkable assertion that the coolie trader in Pretoria can buy his material at a lower cost and obtain a longer credit than the white man.

Change of Address.—Messrs. Burn Brothers, manufacturers and patentees of sanitary specialities, have removed from 23 and 24, Charing Cross, Whitehall, London, W., to their new offices and works at 3, Blackfriars Road, S.E.

Messrs. G. & A. Brown, Ltd., of 167, Hammersmith Road, London, have opened a West-End showroom, for the use of architects and others, at 85, Newman Street, Oxford Street, W., where they are showing plaster ceilings, cornices, friezes, chimney-pieces, wall-panelling, mouldings, composition and Carton-Pierre ornaments, &c.

Taxing White Lead Imported into Canada.—One of the Canadian Budget proposals is to raise the tariff on dry white lead from 5 per cent. to 30 per cent., in the interests of British Columbian leadminers and Montreal producers of this commodity. No doubt the tax will have its effect on the price of paint throughout the Dominion, and it may conceivably do something to stimulate the consumption of lead substitutes. Linseed oil, the other great staple of the industry, is made unnaturally dear in Canada by an impost of 25 per cent. Even this does not wholly shut out English competition, and a faint hope may be indulged that the new restriction will be similarly ineffectual.

Careless Foremen make Careless Workmen.—At the Paddington Coroner's Court recently Mr. W. Schroeder spent nearly two hours investigating the death of a stonemason named John Langdon, aged 55, employed by Messrs. Holloway Brothers, contractors and builders, who fell 50ft. from a scaffold at Hanover House, a block of flats in course of erection in High Street, St. John's Wood. At the place where the deceased fell the guard-boards had been removed the day previous in order that some scaffold poles might be lowered, and they had not been replaced because the work on that "ledger" had been finished or nearly so. The foreman in charge, Thomas Hosken, admitted that he had pointed out to the deceased a small joint which needed pointing, but it was 20ft. away from the spot where deceased fell, and he did not know why the deceased mixed his mortar there unless it was that a box convenient for mixing happened to be standing just where the guard-boards had been removed. During his evidence this witness spoke of the carelessness of workmen, and the Home Office inspector, who was watching the enquiry, asked, "Careless foremen make careless workmen, don't you think?" Witness hoped he had not been careless. The Inspector: "You are throwing a reflection on this dead man, and I want to know whether his carelessness was any more than yours? You saw him working in this dangerous spot and gave him no warning." The jury returned a verdict of "accidental death," adding that they were of opinion that the accident would not have occurred if the guard-boards had not been taken away.

IONA CATHEDRAL.

Criticisms of the Restoration Scheme.

SOME lengthy letters have appeared in the Scottish press with reference to the methods employed in the restoration of Iona Cathedral, which we dealt with in an article in our issue for July 27th, 1904, since when another architect has been appointed. The scheme is generally condemned by Mr. A. C. Champneys (the author of the article on "Irish Ecclesiastical Architecture" in the current number of the "Architectural Review"), who writes:—

"The roof of the south transept on the outside is, comparatively speaking, satisfactory; but the rest of the building is covered with slates of commercial appearance and unpleasant colour. The best hope for this roofing seems to be that the ravages of the winter gales may give an opening for its complete removal. The walls of the church were, like other rough masonry, plastered inside. In the larger part of the building this has now been removed, according to the mistaken—and, one had hoped, now nearly obsolete—idea that the mediæval architect liked to display the skeleton of his building, instead of covering it up decently, on the inside at all events. If it could be contended that the plaster was here first added after the Reformation, the walls of the nave and of the cloisters, which were certainly not then 'restored,' would be enough to refute this singular notion about a Gothic building.

"The choir certainly once had a flat internal roof or ceiling, as the corbels and the plaster show. There was doubtless a room above it. The present timber roof, of an uninteresting kind, is open to the top, ignoring the old arrangement, and new corbels have been inserted to carry it, leaving the old ones useless, except as witnesses to the falsity of the 'restoration.' The north transept has been provided with a similar roof, though here, too, the corbels indicate a flat ceiling, and this point is made certain by the presence of a door, which now overhangs vacancy, but once led into the tower from a room above the transept, which, again, was obviously connected with the upper floor of the domestic buildings—the sort of arrangement which is sometimes found in Scotland, and is common in Ireland. This transept has been a special sufferer at the hands of the 'restorer.' In the rebuilding of its northern face, which had been broken away, a commonplace Gothic rose window has been inserted, opening on the inside through an arch supported on Romanesque pillars. Those who completed the cathedral (as it stood until recently) were eclectic, but not quite after this fashion. On the outside the window would have opened into the upper storey of the domestic buildings—this is absolutely clear and unmistakable.

"A Travesty of Restoration."

"The treatment of the north transept has been deplorable; that of the north choir aisle or sacristy is not less unfortunate. Those who saw the building while it was, though roofless, comparatively uninjured, bearing traces of all the stages in its history, will remember that this sacristy had been walled up, and that a beautiful late mediæval doorway had been inserted in the wall. The upper part of this partition has now been removed, and the lower part has above the doorway been cut and adapted into an ugly and ponderous new pediment. This is terminated on one side by a grotesque animal of considerable size, and on the other by a large angel, of very modern and mawkish character—an appalling contrast to the interesting and spirited carving on the old capitals of the south aisle opposite. A place stands reserved at the top of the pediment, I understand, for an image of St. Columba; but I do not know whether this is to be by the same sculptor as that of the angel.

"This certainly does not exhaust all the criticisms that would be justified. And one cannot help asking whether nothing can be done to reverse, or at least to stop, this spoiling and falsification of a building over which morally (though, unfortunately, not legally) the Scottish public has some rights. Besides subscriptions for the restoration of the building being invited by a board at the entrance to the enclosure, attention is called in a notice on the steamer 'to the urgent need of funds to complete the roofing of the ruins and to meet the cost of upkeep in the future'—not for experiments in twentieth century architecture. This notice at least should in fairness be altered.

"Anyone would, of course, wish such a building to be preserved. But it would be a less ignoble fate for it to perish than to be spoilt by such a travesty of restoration. As regards its use for divine service, the feelings which it is now calculated to inspire are most undevotional and un-Christian."

The Architect's Reply.

Mr. J. Honeyman, of Glasgow, the architect who is carrying out the restoration, in the course of a reply to the above charges says:—

"Mr. Champneys mentions only one instance in which old work has been interfered with; and it so happens that he could not have suggested a better illustration of the folly of the course he recommends. I refer to the destruction of fragmentary remains of plaster. Only a very small portion of this possessed any value, but that would have been saved if there had been a resident clerk of works at the church. But there was not—and why? Simply because the trustees were only in a position to spend three or four hundred pounds in the course of the season instead of as many thousands. The risk of a workman making a mistake is almost as great in the one case as in the other, but no one would advise that when the few hundred pounds available are being spent, chiefly in repairs to secure the safety of the building, an additional expense of three or four guineas per week should be incurred to keep a clerk of works there practically idle. The whole work is being carried on at great disadvantage owing to the inadequate support the trustees have hitherto received; and the obvious intention of your correspondent is to perpetuate this state of things.

"His remarks regarding the slating are hardly intelligible. He thinks the slating of the south transept tolerably satisfactory, but the slating of the choir as bad as can be; while both of these roofs are covered with slates of exactly the same description and quality as those which he so unreservedly condemns. The roofs, I may say (with the exception of that of the north transept), were constructed and slated before I was asked to advise the trustees. The kind of slate selected was those which I have no doubt were on the building; but when roofing the north transept I took care to get the heaviest slates of the kind which the quarries could supply.

The North Transept.

"Now, as to the deplorable restoration of this transept. If Mr. Champneys had been better informed he would have recognised that there is no restoration at all, nor any attempt at restoration. Part of the east wall was in imminent danger of falling, and that was most skilfully repaired by a contractor of immense experience in work of the kind. But the gable is in no sense a restoration; it is a new design, adapted to altered conditions, yet harmonising generally with its surroundings, and so far as the effect of the wheel window is concerned, while Mr. Champneys is quite entitled to hold his opinion, I am—still more, I think—entitled to hold mine. He is also quite welcome to exhibit his ignorance by suggesting an alternative treatment which is impracticable, and which

would leave the north gable without any window where light is now so much needed.

"Regarding the restoration of the arcade on the north side of the choir, Mr. Champneys says not one word to justify his supercilious remarks. The restoration of the lower order of these arches was absolutely necessary to admit of the removal of the rubble beneath them; but the original design was preserved with the greatest care, and the effect of the opening up of these arches is most satisfactory in every respect. The only thing here which the critic condescends to specialise is a comparatively insignificant piece of work which makes no pretence of being a restoration, but is merely designed to meet new conditions.

"The beautiful old door is left untouched, but if its masonry had been examined more carefully by Mr. Champneys he would have seen that unless a piece of vertical wall-face had been left above it, this would not have been the case; and also that there were other reasons for leaving some wall there. Perhaps he can devise some other treatment which would better fulfil these conditions, and at the same time relieve the central column down to the plinth of its base. He might also be good enough to state how it would be possible to minimise this pediment—which he styles 'ponderous'—consistently with ordinary Gothic precedents.

The Treatment of the Carving.

"As to the treatment of the carving, there is perhaps some room for difference of opinion. For my part, I have no sympathy with those who advocate the introduction of sham antiques. In this matter I am guided by the principle which invariably guided mediæval architects. Unless this principle had been respected during the Middle Ages we could have had no such thing as comparative architecture now. Had the architect of this old door not adhered to this principle when he inserted it in a wall some centuries older we would have lost much insight into the history of the building. In the same way new work, introduced into the building for the first time now, may, if done after the manner of the time, carry some truthful message down to future ages. The sham archaic can only mislead.

"I cannot ask you to allow me space to deal more in detail with your correspondent's absurd statements and unwarrantable assumptions. I will only add that for much of the work commented on I am not responsible, but I am not disposed to admit that Mr. Champneys has any right to speak of it as he does, and still less to pose as an expert in connection with work which he evidently does not understand. With the exception of the few patches of rotten plaster still adhering to the wall after several centuries of exposure in the stormy climate of Iona, which have already been referred to, Mr. Champneys cannot point to a single instance where old work has been destroyed. The trustees are strictly conservative in their ideas. Their object is much more to preserve than to restore, and to restore not for its own sake, but as a means to that end, and that they may be in a position to protect not merely the precious buildings themselves, but many of the beautiful and priceless crosses and sculptured slabs entrusted to their care. There is not the slightest excuse for the ungentlemanly insinuation that they or their advisers mean to do otherwise. I trust that the result of Mr. Champneys' premature and unjustifiable interference will be different from what he expected, and that it will create a reaction in favour of the vigorous prosecution of the undertaking."

Mr. Champneys' Retort.

In reply to this letter of Mr. Honeyman Mr. Champneys writes: "I shall not comment on the expressions that he uses further than to say that the free use in controversy of words like 'absurd,' 'ignorant,' and so on,

is not usually considered to show a strong case or to add to any strength which a case may possess. And the question, after all, is not whether I am an 'expert,' but whether the statements in my letter were true. I do not quite follow his statement about the slating; it seems to suffer from some clerical error. If he means to say that the slates of the south transept are not (whether accidentally or otherwise) of a different colour and appearance from those of the choir, I think that the general verdict of persons not colour-blind will be against him.

"One principal charge which I brought against the restoration (as it is called) is that the building has been falsified by the erection of internal roofs different from those which were originally there. I do not gather that Mr. Honeyman denies this. As to the plaster, I do not understand what was the particular value which he attributes to certain bits of it. The question, I should have thought, is whether the cathedral had been plastered inside or not. Like other similar mediæval work, it certainly was. I do not understand that Mr. Honeyman denies this. Now most of it has been scraped. However, the loss of certain fragmentary remains of plaster possessing value was, it appears, due to the absence of any adequate supervision of work done on an ancient building of immense interest, owing to deficiency of funds. (The distrust on the part of the public which led to this deficiency seems to me to have been fully justified.) But were the trustees bound to finish the building, including its ornamental details, in two or three years, with inadequate funds? Might not, for instance, the pulling-down of the wall shutting off the sacristy have been at least deferred—such party-walls being not uncommon in mediæval churches—and with it the pediment and the angel? This would not have endangered the safety of the building. After all, the general appearance of the walls and the form of the roofing are rather considerable points in a church. I said that the building had been falsified, and this, to the large extent stated above, Mr. Honeyman apparently does not deny.

"I also expressed the widespread opinion that the cathedral had been spoilt by incongruous and ugly work. As regards the north transept, though 'the trustees are strictly conservative in their ideas,' and though subscriptions are asked for restoration, it appears that the Gothic rose-window in a Romanesque arch is not intended for a restoration. Of course, I never thought that it really was one; the word should perhaps have been in inverted commas, but it is often loosely used; certain notorious new work in St. Albans Abbey is sometimes thus spoken of. However, the window and the carving about the pediment are now said—by Mr. Honeyman—to be valuable as original work. The latter may, 'if done after the manner of the time, carry some truthful message down to future ages.' If the angel remains, I agree that it is not likely to be mistaken for mediæval work. But is not this claim by an individual architect to inaugurate a new architecture at the present day a somewhat bold one, and could not the new art be more safely experimented with in new buildings? And while sculpture (in the new style) is being completed, most of 'the beautiful and priceless crosses and sculptured slabs' are being left exposed to the weather in and near St. Oran's Chapel.

"Mr. Honeyman is well satisfied with the newest work at Iona. No doubt he is, or he would presumably not have designed it, but he can hardly expect to be regarded at the same time as an impartial judge of it. And in general he cannot have it both ways. He cannot restore (in any real sense) and at the same time introduce into an ancient church features and designs which could not possibly have existed there. The trustees cannot be

'strictly conservative in their ideas' and at the same time spend money on twentieth-century architecture. And whether it is that the new art makes the old seem poor, or (as I rather think the verdict will be) that the new is in painful contrast to the old, at all events the two are wholly incongruous."

Law Cases.

A Building Line Dispute.—In the King's Bench Division recently Mr. Justice Phillimore heard the case of *Dowsett v. Ramuz*, in which the plaintiff prayed for an injunction restraining the defendant from building in Victoria Avenue, Southend-on-Sea, beyond the building line mentioned in an indenture of conveyance of October 26th, 1878, in breach of covenants' stipulations in that behalf therein contained. It appeared from the affidavit sworn by the plaintiff that on October 26th, 1878, certain property, part of the Milton Hall estate in Southend-on-Sea, was conveyed to one Hudson; that by that deed the purchaser covenanted that no buildings should be erected on the land thereby conveyed between the building line 35ft. from the road and the roadway shown on the plan, except fences; that Hudson shortly after erected a private dwelling-house, called Eton House, upon the land purchased, the main part of which stood back 35ft. 6ins. on each side of the bays, and the bays 32ft. 5ins., from the said road; that in 1881 the plaintiff built Roynce villa on the adjoining piece of land, the frontage being the same distance from the road; that it was customary at Southend to allow owners to bring forward their bay windows slightly beyond the stipulated building line; that the defendant in 1904 became the purchaser of Eton House and purported to convert the house on the ground floor into shops, and for that purpose deposited plans, which were duly passed, showing that the building line of his house would be brought forward to 32ft. 4½ins. from the road; that this would be prejudicial, not only to the owner of Roynce Villa, but also to all the other purchasers, who had bought on the same conditions. The defendant, in his answer, affirmed that the plaintiff's house and the two houses adjacent had bay windows projecting 3ft. beyond the building line; that since the time of the erection of Eton House and Roynce Villa the character of the locality had changed from residential houses to shops.—Mr. Justice Phillimore said that both the plaintiff and defendant had been equal sinners. Upon the whole, he thought it was not only an excess, but so great an excess, that it ought to be restrained. He was justified in that by two considerations—(1) the defendant began the breach; and (2) it was a practice in Southend to allow bay windows beyond the building line; therefore, the infringement by bay windows was trivial, and therefore he thought the plaintiff was entitled to an injunction restraining the defendant from building as shown in the plans deposited by him with the town council and passed by them.

The Right to acquire Property.—The case of *Pescod v. the Mayor, &c. of the City of Westminster* was heard recently by Mr. Justice Eady. The plaintiff, a tailor, of 30, Piccadilly, sought an injunction to restrain the defendants from acting upon a notice to treat with him for the compulsory acquisition of his interest in those premises, which they wanted for their scheme of widening Piccadilly. The action raised the question whether the defendants had the right to give notice to take the whole of the premises when all that was necessary was a strip 22ft. wide. Mr. Pescod's complaint was that the notice was given not because the whole of the premises were required for the actual widen-

ing, but for the purpose of enabling the Council to carry out a contract it had entered into with a private company, which was to erect an hotel. The defendants contended that the work to be executed by them could not be done while the plaintiff was in occupation of any portion of his premises. Mr. Justice Swinfen Eady, in delivering judgment, said in his opinion the plaintiff had not any absolute right to prevent the defendants from taking more land than they intended actually to dedicate to the public. He thought they had *bonâ-fide* adjudged that the whole house was essential to the widening they proposed, and he dismissed the action with costs.

Damages for Libel.—At Leeds Assizes on Thursday Messrs. Dickenson & Son, a local firm of builders, were awarded £100 damages against the Bradford and County Constitutional Press Co. (Ltd.), late proprietors of the "Daily Argus," published at Bradford. The libel was in respect of two letters which had appeared in the "Argus," a term having been used which was understood to mean that they were jerry-builders.

An Asylum Contract.—At the recent Kent Assize Mr. Justice Bray heard the case of *Wise v. The Asylum Committee of Canterbury and W. J. Jennings, architect*. It was a claim for money due from the Corporation of Canterbury in respect of certain buildings which the plaintiffs had erected, and for damages against the architect for failing to certify the proper amount due at the proper time. Plaintiffs erected certain asylum buildings, the contract price for which was £12,950. The work was finished in March, 1901, and the plaintiffs applied to the architect for the final certificate, but (according to counsel) he refused this. When afterwards called upon for explanation he said that the work was unfinished, and then went on to say that the work unfinished was that which he had himself ordered to be omitted from the contract. The plaintiffs went back and did this work, which cost over £2,000, and the defendant had refused to pay them a penny for this. When they demanded a certificate for the work done, so that they might get half of the amount which they were entitled to by the retention, they were refused and told that they had been overpaid. After considerable argument it was announced that the plaintiffs consented to judgment for the defendants with costs, and also withdrew every imputation that had been made against Mr. Jennings. The question of the amount due under the contract it was agreed should be referred to a person to be named by the Royal Institute of British Architects.

"Reckless Charges."—In the Court of Appeal recently the case of *Roberts and another v. Stythe* was heard. The plaintiffs, who are builders carrying on business at Llandudno, brought the action against the defendant, Mr. R. R. Stythe, of Carnarvon, to recover £416 under a building contract. Mr. Justice Bucknill made an order staying the action and referring the dispute to the architect named in the contract, Mr. Rowland Lloyd Jones. The plaintiffs appealed against this order, contending that he was not a fit and proper person to determine the dispute. It was alleged that, under the threat of an action for negligence being brought against him by the defendant, the architect had sanctioned certain deductions, and that, therefore, his mind was biased. The architect denied that he had ever been threatened by the defendant, and stated that the deductions which he made from the plaintiffs' claim were made on his own judgment and quite independently of the defendant. In giving judgment the Master of the Rolls said that the plaintiffs, having deliberately elected by the contract to refer all disputes to the architect, had sought to get rid of him

by throwing mud at him and making aspersions against his character. A more reckless charge he (the Master of the Rolls) had never seen upon an affidavit, because for the allegations made it was clear there was not the slightest foundation. There was no ground shown justifying this appeal, and it must be dismissed with costs.

An Insecure Coal-plate.—At the recent West Riding Summer Assize an action was brought by Miss Ella Reinhartz, a sanitary inspector in the employ of the Leeds Corporation, for damages for personal injuries against Messrs. J. W. & H. Collinson. According to the plaintiff's statement she was walking down Park Square, in Leeds, on the morning of December 22nd last, and put her foot on a round iron plate which covered the mouth of a coal shoot at No. 24, Park Square, which were premises leased by the defendants. The plate was not properly secured, for the plaintiff's foot caused the plate to tilt up at one end and her leg slipped down the aperture. She was somewhat severely injured, and it was discovered that she was suffering from rupture. For the defence it was contended that the real cause of the accident was the falling away of the brickwork which supported a crossbar which held the fastening of the plate. The judge, in summing up, said that the action was of some importance, because it was one of those cases where a tenant might be legally, although not morally, responsible, but it was clear that responsibility must be fixed upon somebody. The defence was that the structure of the plate was bad, and if it were so it was their duty to point it out to the landlord. In this instance the responsibility of the tenants was lessened by the fact that they had not entered into actual possession of the premises at the time of the accident. The jury returned a verdict for the plaintiff for £140, with costs, but they were unable to agree as to whether the plate was an outside or an inside repair.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Cotton Spinning Mills.

ROCHDALE.—AN OLD READER AND WELL-WISHER writes: "On p. 83 of your issue for August 9th, I notice you have an enquiry relating to 'Cotton Spinning Mills,' which is not answered satisfactorily. The book you should recommend is a new one issued by Mr. John Heywood, Deansgate and Ridgefield, Manchester, and 29 and 30, Shoe Lane, London, E.C. It is called 'Recent Cotton Mill Construction and Engineering,' by Mr. Joseph Nasmith. The price is 4s. 6d. nett."

South Kensington Building Construction Examination.

CHORLEY.—STUDENT writes: "Do you intend to publish the answers to building construction, stage I. and II, this year?"

No, not this year.

Weight of Ceiling.

SUNBURY-ON-THAMES.—E. H. writes: "I am very much interested in the reply to 'H. G. V. O.' in your issue for July 26th, which I follow clearly but do not quite understand how the reactions are arrived at, as the total weight of ceiling is 4,100 lbs., and it would seem that one-half, or 2,050 lbs., should be on each support. I see how the load at joint G H B (775 lbs.) is arrived at,

but should like to know why the load on the joint G A F is not given."

The load 1,575 represents the line A C in the stress diagram, and is the resultant force acting at the point of support for the truss. The total reaction is 1,575 lbs. plus half the load on the member A—G, but the latter load has no influence on the stresses in the truss, and has therefore been omitted in order to simplify the diagram. S. N.

Valuing Architect and Surveyor's Business.

WATFORD.—SEPIA writes: "How is the value of a partnership in an architect and surveyor's business determined?"

Three years' purchase is usually taken as the value.

Terazzo Floors.

GLASGOW.—MOZAIC writes: "What is the proper composition in quantities of marble and cement for terazzo floors? Please name a book on the subject."

See the "Marble Mason and Mosaic Worker" section in "Specification, No. 8," published from our offices, price 2s. 6d. or 3s. 3d. post free.

Competition for the Palace of Peace.

BOURNEMOUTH.—G. A. B. L. writes: "Where can I obtain particulars of the competition for the proposed Palace of Peace at the Hague?"

Competitors may obtain particulars and information from Mr. D. E. C. Knuttel, architect, 16, Fluweelen Burgwal, The Hague, Holland. The full conditions, with plan and a view of the site, will be published in "The Architectural Review" for September.

Efflorescence on Tiles.

KING'S LYNN.—W. H. writes: "We had a new tile floor put down in a showroom last January and have been troubled with a white growth through the tiles ever since, more especially on cold days; in fact, the colder the weather the worse is the growth. Our builder says it will disappear in time, but it still remains, and is a great eyesore. How can the nuisance be overcome?"

We presume the trouble is efflorescence, and should suppose it to come from the cement in which the tiles were fixed. If this is so it would make its appearance most when the floor is drying after being wetted. We do not see how it can be stopped; it will wear out in time.

Unfair Charges by Architect.

GLASGOW.—G. G. writes: "After commencing business and carrying out several minor contracts, we were successful in securing through an architect a contract of a much larger amount. In appreciation of his kindness we endeavoured to find several clients for him, and in one instance we were successful in doing this. Later, having a dispute with one of our sub-contractors on this job, he was good enough to lend our agents a detailed plan and also to look up one or two letters. In each instance the time occupied in so doing would not exceed ten minutes. He now presents an account for professional services exceeding that charged by our agents, who carried the whole case through the court. (1) What is your opinion of his action? (2) Are we liable?"

If the facts are as you state, we think the architect's action is sharp practice, and that he should not have made any charge, but in any case he is only entitled to charge for the time occupied by him in looking out the letters and details.

The west front of the Priory Church, Dunstable, is being restored. Mr. G. F. Bodley, R.A., is superintending the work, which will cost £5,000.



These cottages have been erected at a cost of £350, complete, from designs by Mr. Lionel U. Grace, architect, of 30, John Street, Bedford Row, W.C.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :			
Aug. 17	Kettering—Church	Mr. G. W. C. Soltan Symons ...	Rev. G. W. Wellburn, Sunrise, St. Peter's Avenue, Kettering.
" 17	Burley-in-Wharfedale—Houses	National Provident Institution ...	Milnes & France, 99 Swan Arcade, Bradford.
" 17	Plympton St. Mary—Cowshed	Guardians	G. W. Soltan, 7 Courtenay Street, Plymouth.
" 17	Milford Haven—Houses	Chapel Committee	J. B. Gaskell, Estate Office, Milford Haven.
" 17	Preston—Scully	Lunatic Asylum Committee ...	Clerk of Woods, Fulwood Workhouse, Preston.
" 18	Upper Llandwrog—House	Skipton Cattle Market Co. ...	E. F. White, Architect, 27 Bangor Street, Carnarvon.
" 18	Downpatrick, Ireland—House	Education Committee	Asylum, Down.
" 18	Skipton—Cattle Market	School Board	J. W. Broughton, Architect, 19 High Street, Skipton.
" 19	Malton—Church Restoration	J. B. Fortescue	C. H. Channon, Architect, Malton.
" 19	Penydarren—Cementing and Repairing	J. Terrell	E. J. Phillips, Church Street, Penydarren.
" 19	Glass Houghton and Denby Dale—School Works	Education Committee	J. Vickers-Edwards, County Hall, Wakefield.
" 19	Inverkeithing—Alterations to School	Nantddu Building Company ...	J. C. Sims, Architect, Inverkeithing.
" 19	Lostwithiel—Offices	Education Committee	A. E. Skentelbery, Architect, Lostwithiel.
" 21	Stoke-under-Ham—Cottages	Captain Penrice	J. Terrell, North Street, Stoke-under-Ham.
" 21	Manchester—School Additions	Joint Hospital Board	School of Technology, Sackville Street, Manchester.
" 21	Edwardsville—Houses	Trustees	J. L. Smith & Davies, Architects, Aberdare.
" 21	Eynsford Crookhill—School	Plans and Buildings Committee ...	W. Harston, Architect, 8 Hythe Street, Dartford.
" 21	Silloth—Villa	J. Adamson & Co., Ltd. ...	G. Armstrong, Architect, 24 Bank Street, Carlisle.
" 21	Thornton—Hospital Ward	Education Committee	S. Spencer, Architect, Old Bank Chambers, Great Horton, Bradford.
" 21	Methwold, Norfolk—Chapel Repairs	Trustees	Whitta & Sons, Methwold.
" 21	Nelson, Lancs—Setting back Walls	Rev. J. M' Eldowney	B. Ball, Borough Engineer, Town Hall, Nelson.
" 21	Harrow—Factory Extensions	School Board	Johnstone Brothers, Architects, Lowther Street, Carlisle.
" 22	Croydon—School	Guardians	J. Smyth, Clerk, Education Offices, Croydon.
" 22	Cardiff—College Foundations	Sir P. C. J. Milbank	W. D. Caroe, Architect, 8a Whitehall Place, London.
" 22	Queen's Ferry—Schools	Urban District Council	Green, Knowles & Russell, 19 South John Street, Liverpool.
" 23	Drumaneeny—School	Pengaulan Building Co., Ltd. ...	E. J. Toye, Architect, 20 Great James Street, Londonderry.
" 23	Southwell—Chapel Renovation	N. Cornwall China Clay, Ltd. ...	Rev. J. T. Frost, The Mansi, Southwell.
" 23	Edinburgh—School Works	Guardians	Mr. Carfrae, Architect, 3 Queen Street, Edinburgh.
" 23	Lambeth, S.E.—Converting Houses	Hornsey Town Council	E. C. Beaumont, Architect, 78 Fleet Street, E.C.
" 23	Norton—Farmhouse	Education Committee	J. Taylor, Architect, Exchange Chambers, Hereford.
" 23	Shipley—Fire-station	H.M. Office of Works	W. H. Beevers, 26 Bond Street, Leeds.
" 23	Pontshonorton—School	H. H. Laity	P. R. A. Willoughby, Pontypridd.
" 23	Penrhinwelfer—Houses	University College Council ...	J. L. Smith & Davies, Architects, Aberdare.
" 23	Penpoint—Clay Kilns, &c.	Town Council	S. H. Anshew, Engineer, St. Austell.
" 23	Houghton-le-Spring—Cells	Education Committee	Master, Union Workhouse, Houghton-le Spring.
" 24	Durham—Houses	Urban District Council	G. Ord, Architect, 16 The Avenue, Durham.
" 24	London, N.—Hospital Block	H.M. Office of Works	E. J. Lovegrove, Municipal Offices, 99 Southwood Lane, Highgate.
" 24	Kedington, Suffolk—Additions to Workhouse	Guardians	J. Bigmore, Clerk, 24 Queen Street, Haverhill, Suffolk.
" 25	Bradford—Works	Education Committee	Education Office, Manor Row, Bradford.
" 26	Cricklewood—Sorting Office	H.M. Office of Works	J. Wager, H.M. Office of Works, Storey's Gate, S.W.
" 26	Bosfrankan—Pigery	H. H. Laity	H. H. Laity, Bosfrankan, St. Buryan, Cornwall.
" 26	Cardiff—Foundations	University College Council ...	W. D. Caroe, Architect, 8a Whitehall Place, London, S.W.
" 26	South Shields—Car-sheds	Town Council	S. E. Burgess, Borough Engineer, South Shields.
" 26	Macclesfield—School	Education Committee	J. F. May, 43 Church Side, Macclesfield.
" 26	Heysham—Council Offices, &c.	Urban District Council	H. Miller, Surveyor, Council Offices, Heysham.
" 29	London—Admiralty Extension	H.M. Office of Works	Sir Aston Webb, 19 Queen Anne's Gate, S.W.
" 29	Chelsea—Staircase	Guardians	Guardians' Offices, 250 King's Road, Chelsea, S.W.
" 31	New Romney, Kent—Re-slatting Roof of Town Hall	Town Council	Borough Surveyor, New Romney.
Sept. 1	London, N.—School	Finchley U.D.C.	W. G. Wilson, Architect, 5 Bloomsbury Mansions, Hart Street, W.C.
" 4	Aberdare—Classrooms	Education Committee	J. Morris, Town Hall, Aberdare.
" 5	Blackburn—Post Office	H.M. Office of Works	Postmaster, Blackburn.
" 6	Clutton—Alterations at Workhouse	Guardians	W. F. Bird, Architect, Midsomer Norton.
" 11	Ipswich—School	Education Committee	E. T. Johns, Thororoughfare, Ipswich.
" 16	Wallasey—Schools	Urban District Council	J. Holt, Architect, 9 Albert Square, Manchester.
" 20	Aylesbury—Schools	Education Committee	Clerks of Works Department, Education Office, Aylesbury.
" 26	Somersham, Ipswich—School Enlargement	Education Committee	G. W. Leighton, Princes Street, Ipswich.
No date	Thornbury—Residence	Education Committee	J. Young & Co., Architects, 62 Market Street, Bradford.
ENGINEERING :			
Aug. 17	Bromsgrove—Sewage Tanks	Barnsby Hall Asylum Committee	Willcox & Raikes, 63 Temple Row, Birmingham.
" 18	Stowmarket—Sewer	Urban District Council	G. W. Lingwood, Station Road, Stowmarket.
" 19	Rhymney—Covering Tanks	Town Council	W. Lloyd Marks, 61 High Street, Rhymney.
" 19	Pembroke—Gas Plant	Corporation	Town Clerk, Pembroke.
" 19	Bury, Lancs—Ice Plant	Urban District Council	A. W. Bradley, Borough Engineer, Bury.
" 21	Skipton—Reservoir	County Council	G. H. Hill & Sons, 3 Victoria Street, S.W.
" 21	Rickmansworth—Reconstruction of Bridge	Urban District Council	County Surveyor's Office, Hatfield.
" 23	Honley, near Huddersfield—Iron Roof	Corporation	Gas Manager, Honley.
" 23	Barrow-in-Furness—Sewer	Urban District Council	Borough Engineer, Town Hall, Barrow-in-Furness.
" 28	Selby—Pumping Machinery	Urban District Council	P. Griffiths, M.I.C.E., 54 Parliament Street, Westminster, S.W.
" 28	Witham—Steam Roller	Urban District Council	W. P. Perkins, Surveyor, Witham.
" 30	Port Talbot—Coaches	Port Talbot Rly. & Docks Co.	E. Knott, Secretary, Port Talbot.
Sept. 1	Merthyr Tydfil—Destructor Plant	Corporation	T. F. Harvey, Town Hall, Wolverhampton.
" 1	Wolverhampton—Pumping Engine	Corporation	E. A. B. Woodward, Town Hall, Wolverhampton.
" 4	Southampton—Pumping Engines	North-Eastern Railway Co. ...	Borough Engineer, Market Chambers, 123 High St., Southampton.
" 4	Scarborough—Bridge	Metropolitan Asylums Board ...	W. J. Cudworth, Engineer, York.
" 5	London, S.E.—Alterations to Engineering Arrangements... ..	Docks Committee	W. W. Squire, Cumberland, York.
" 11	Scotcoates—Swing Bridge	Urban District Council	T. Swatheridge, Council Offices, 7 North Street, Bishop's Stortford.
" 11	Bristol—Pumping Machinery	Directors	Sir J. Wolfe Barry & Partners, 21 Dalabay Street, Westminster, S.W.
" 12	Bishop's Stortford—Pumping Engine	Municipality	Director-General of Harbours and Lighthouses, Alexandria.
" 20	Immingham—Dock		C. H. Shanahan, Municipal Office, Mussoorie, India.
Oct. 10	Alexandria, Egypt—Quays		
" 23	Mussoorie, India—Electric Lighting and Waterworks Scheme		
IRON AND STEEL :			
Oct. 9	Mussoorie, India—Pipes, &c.	Municipal Board	C. H. Shanahan, Municipal Office, Mussoorie.
PAINTING AND PLUMBING :			
Aug. 17	Elham—Painting Cottage Homes	Guardians	R. Lonergan, Clerk, 11 Cheriton Place, Folkestone.
" 19	Poole—Painting	Harbour Commissioners	H. F. J. Barnes, Towngate Street, Poole.
" 19	Bury—Painting	Municipality	Borough Engineer's Office, Bank Street, Bury.
" 21	Banarach—Painting and Plumbing		P. Fulton, Architect, Forres.
" 21	Buckie—Painting and Plumbing	H. W. Gunn	H. W. Gunn, West Church Street, Buckie.
" 25	Buckingham—Interior Renovation of School	Education Committee	G. Bennett & Son, Buckingham.
" 28	Gateshead—Cleaning and Painting at Schools		E. J. Harding, Education Offices, Gateshead.
ROADS AND CARTAGE :			
Aug. 17	Scarborough—Making-up	Town Council	H. W. Smith, Borough Surveyor, Scarborough.
" 19	Barnet—Making-up Road	Urban District Council	H. W. Mansbridge, Surveyor, 40 High Street, Barnet.
" 23	London, S.W.—Roads and Sewers		H. R. G. S. Smallman, 8, Queen Street, Cheapside, E.C.
" 24	London, N.—Road Works	Hornsey Town Council	E. J. Lovegrove, Borough Surveyor, 99 Southwood Lane, Highgate.
" 24	Highgate, N.—Road Construction	Urban District Council	E. Millard, 1, Finsbury Circus, E.C.
" 30	Enfield—Making-up	Corporation	S. W. Scott, Clerk, Public Offices, Enfield.
Sept. 4	Southampton—Stone		J. A. A. Crowther, Borough Engineer, Southampton.
SANITARY :			
Aug. 17	Moreton Morrell—Sewer	Stratford-on-Avon R.D.C. ...	J. Brook, Surveyor, College Street, Stratford-on-Avon.
" 17	Rhymney—Covering two tanks	Urban District Council	W. Lloyd Marks, 61, High Street, Rhymney.
" 21	Dudley Colliery—Sewer	Urban District Council	W. Webb, Clerk, Council Offices, Dudley.
" 22	Chadderton—Sewers	Urban District Council	J. Diggle & Son, 14 Victoria Street, Westminster, S.W.
" 24	Barnston—Sewerage Works	Rural District Council	W. M. Beckett, Engineer, 33, Brazénose Street, Manchester.

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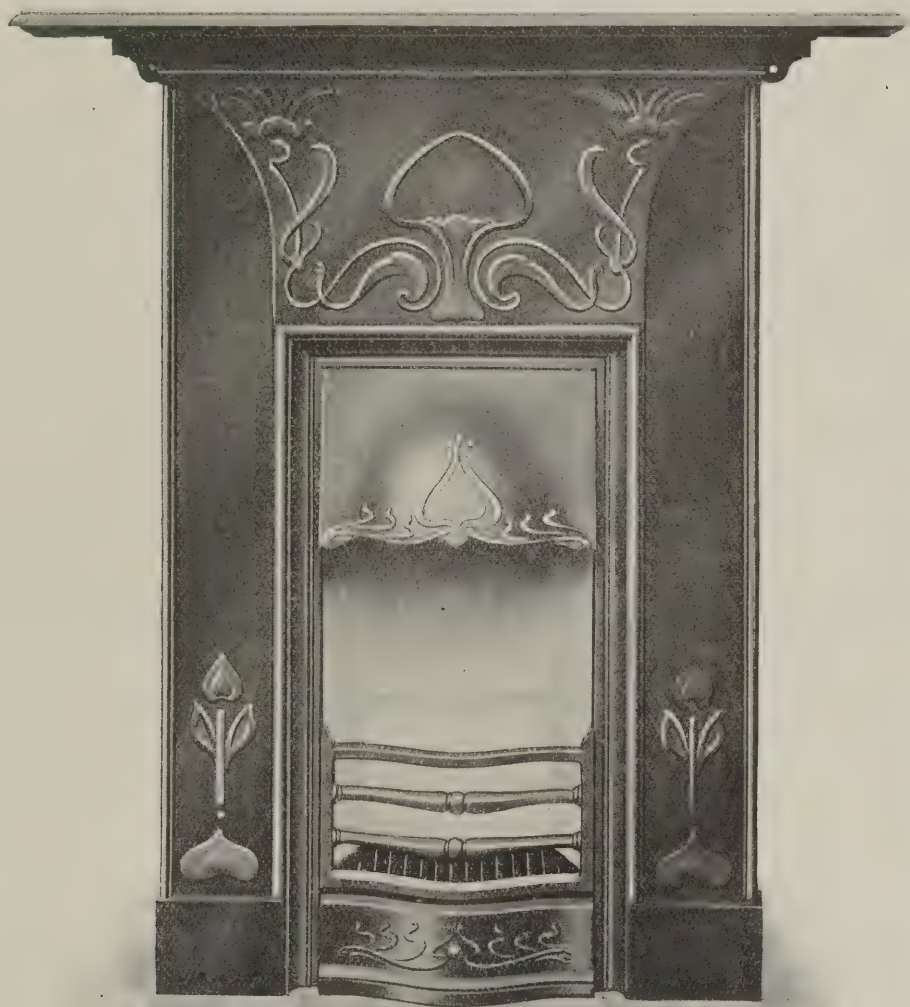


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Electrical Notes.

Lamp Filaments.

Experiments have been made in the manufacture of carbon filaments by Mr. J. W. Howell, who claims to have produced a carbon filament possessing new and important features, both scientific and commercial.

The methods employed by Mr. Howell in obtaining these results were recently explained in a paper read by him before the American Institute of Electrical Engineers, and may be summarized under the title of high-temperature baking or firing, the agent employed to effect the purpose being an electric furnace of the incandescent type, consisting of a carbon tube (having water-cooled copper connections) into which are passed cylindrical carbon boxes packed with filaments. To prevent combustion the tube is embedded in powdered carbon.

It is a well-known fact that a carbon filament heated to exceptional temperatures by a current in an exhausted bulb derives no benefit from the treatment, but it is otherwise when the filament is heated by external means to the highest attainable temperature at atmospheric pressures. The special point established in the paper in question is the markedly different effect which is produced when a so-called "treated" filament is "fired" by subjecting it to high temperatures in the electric furnace, as distinguished from the effect produced when a base filament, made from the usual squirted cellulose thread, is so subjected. By a treated filament is, of course, meant one which has been heated electrically in hydro-carbon to produce an additional coat of carbon. The ordinary base filament, whilst improved in some respects by the firing process, undergoes no very marked change in resistance. As the temperature rises the resistance falls, but at different rates.

It is otherwise, however, with the fired treated filament. The resistance in this case becomes not only greatly reduced when cold, but is actually reversed as the temperature is increased, and rises, in fact, as with ordinary metals. By reason of this property the term "metallized filament" has been given to filaments which have undergone this treatment. The resistance of a fired treated filament depends upon the relative thickness of the base and of the deposited coat, and upon the temperature of the firing.

Metallized filaments blacken the lamp bulbs much less than ordinary filaments, a point of considerable economic importance. This may be due to the elimination of mineral and other matters from the base filament. What is of still greater commercial importance is the fact that metallized filaments are more stable at high temperatures; they give, it is claimed, a useful life of 500 hours' run at 2½ watts per c.p., as compared with a similar life with lamps of the best ordinary type run at 3½ watts per c.p. Further, owing to the rise that occurs in resistance as the temperature increases, the lamps should be especially well suited for use on circuits of varying pressure.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans ...	per qr.	1	12	2	1	17	0
Clover, best ...	per load	3	12	0	4	0	0
Hay, good ...	do.	3	10	0	3	17	0
Sainfoin mixture ...	do.	3	7	0	3	15	0
Straw ...	do.	1	12	0	2	0	0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1	0	5	—	—	—
Colza Oil, English ...	do.	1	2	9	—	—	—
Copperas ...	per ton	2	0	0	—	—	—
Lard Oil ...	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate ...	per ton	16	0	0	—	—	—
Do. red ...	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	0	17	10½	0	18	3

Petroleum, American ...	per gal.	£	s.	d.	£	s.	d.
Do. Russian ...	do.	0	0	5½	0	0	5½
Pitch ...	per barrel	0	8	0	—	—	—
Shellac, orange ...	per cwt.	8	14	0	0	9	8
Soda, crystals ...	per ton	3	2	6	3	5	0
Tallow, Town ...	per cwt.	1	4	0	—	—	—
Tar, Stockholm ...	per barrel	1	6	0	—	—	—
Turpentine ...	per cwt.	2	4	10½	—	—	—

METALS.

Copper, sheet, strong ...	per ton	83	0	0	—	—	—
Iron, Staffs, bar ...	do.	5	12	6	8	0	0
Do. Galvanized Corrugated sheet ...	do.	10	12	6	10	15	0
Lead, pig, Soft Foreign ...	do.	13	17	6	—	—	—
Do. do. English common brands ...	do.	14	0	0	14	5	0
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	15	0	0	—	—	—
Do. pipe ...	do.	16	0	0	—	—	—
Nails, cut clasp, 3in. to 6in. ...	do.	9	5	0	—	—	—
Do. floor brads ...	do.	9	0	0	—	—	—
Steel, Staffs, Girders and Angles ...	do.	5	7	6	5	12	6
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign ...	do.	150	15	0	151	5	0
Do. English ingots ...	do.	149	0	0	151	10	0
Zinc, sheets, Silesian ...	do.	26	15	0	—	—	—
Do. do. Vieille Montaigne ...	do.	27	0	0	—	—	—
Do. Spelter ...	do.	24	0	0	24	15	0

TIMBER.

Soft Woods.

Fir, Dantzic and Memel ...	per load	2	15	0	5	0	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American ...	do.	3	0	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Sandarne, Yellow, 3rd, 4x9 ...	per std.	12	5	0	—	—	—
Do. Archangel, Yellow, 3rd, 3x11 ...	do.	8	15	0	—	—	—
Do. do. do. 3x11 ...	do.	8	10	0	8	15	0
Do. do. do. 3x9 ...	do.	9	10	0	9	15	0
Do. Mesane, Yellow, 3rd, 3x8 ...	do.	9	15	0	—	—	—
Do. do. 4th, 3x9 ...	do.	8	15	0	—	—	—
Do. Gefse, Yellow, 3rd, 3x9 ...	do.	10	5	0	—	—	—
Do. Skutskai, Yellow, 1st and 2nd, 3x7 ...	do.	10	15	0	11	0	0
Do. Räfsö, Yellow, 2nd, 3x5½ ...	do.	9	0	0	—	—	—
Do. do. do. 2½x7 ...	do.	9	5	0	9	10	0
Do. Christiansand, Yellow, Unsorted, 3x4 ...	do.	7	15	0	—	—	—
Do. Skelleftea, Yellow, 1st, 2½x7 ...	do.	9	10	0	—	—	—
Do. do. 2nd, 2½x7 ...	do.	9	0	0	—	—	—
Do. Stugsund, Yellow, 4th, 2½x7 ...	do.	9	5	0	—	—	—
Do. Riga, White, Unsorted, 2½x7 ...	do.	7	15	0	8	0	0
Do. Quebec, Spruce, 4th, 3x9 ...	do.	8	0	0	—	—	—

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RELIABLE
FANS ON
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List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Aug. 26	Macclesfield—Schools	—	—	J. F. May, 43 Churchside, Macclesfield.
Sept. 1	Elgin—Cemetery Extension	£10 10s.	—	Stewart & M'Isaac Solicitors, Elgin.
23	Cheshunt—Library	—	£1 1s.	A. Collingwood Lee, Manor House, Cheshunt.
No date	Dartmouth—Town Hall	£50, £30 and £20	—	A. Smith, Borough Engineer, Victoria Chambers, Dartmouth.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEKS ending August 4th twenty-three and August 11th twenty-two failures in the building and timber trades in England and Wales were gazetted.

G. BUXTON, builder, Wimbledon. R.O. Aug. 3rd.
J. THOMPSON, builder, Leeds. Liabilities £443; assets £270.

E. J. HASLOP, builder, Norwood Side, March. P.E., Peterborough Law Courts, Sept. 15th, at 12.
E. BROWN, builder, Easton, Bristol. P.E., Guildhall, Bristol, Sept. 29th, at 12.

C. B. LIXTON, architect and surveyor, Clifton and Bristol. P.E., Bristol Guildhall, Sept. 29th, at 12.

G. APPS, builder, Hayling Island. Adjourned Exam., Portsmouth C.C., Aug. 28th, at 11.

J. HUXTABLE, builder, late Bournemouth and Upper Parkstone. P.E., Poole Town Hall, Oct. 4th, at 10.30.

C. BUTLER, builder, Bow and Leigh-on-Sea. Adj. Aug. 1st.

W. A. FISHER, plumber and glazier, Norwich. P.E., Norwich Shirehall, Oct. 25th, at 11.

T. KELL, bricklayer, late builder, South Shields. P.E., Newcastle-on-Tyne C.C., Aug. 24th, at 11.

G. A. SHAND, plasterer, Halton (late Hastings). R.O. Aug. 4th.

F. HODGES, builder, Isleworth and Ealing. Gross liabilities £11,837; assets £2,859.

FLEW & Co., builders, West Kensington. Liabilities £5,709; estimated assets £29,910.

M. T. RODWELL, plumber, North Evington. Liabilities £197; assets £92.

J. G. SMITH, builder, Colchester. First meeting, Cups Hotel, Colchester, Aug. 17th, at 11.30. P.E., Colchester Town Hall, Sept. 15th, at 11.30.

A. COOK, bricklayer and builder, Harleston. First meeting, O.R.'s, Ipswich, Aug. 18th, at 2.30. P.E., Norwich Shirehall, same day, at 10.30.

POWELL BROTHERS, stained-glass artists and church decorators, Leeds. First meeting, O.R.'s, Leeds, Aug. 17th, at 11.30. P.E., Leeds C.C., Sept. 4th, at 11.

B. NIGHTINGALE, builder, &c., New Cleethorpes. Gross liabilities £11,243; £452 expected to rank; estimated surplus £1,747.

New Companies.

HOWARD & SHANKLAND, LTD., factors of wallpapers, brushes, &c. Capital: £8,000.

HICKS & SYNDICATE, LTD., builders, contractors, &c., 19, Lincoln's Inn Fields, W.C. Capital: £20,000.

MORRIS & Co., LTD., decorators, 449, Oxford Street, W. Capital: £45,000.

CAVITY VENTILATING BUILDING BLOCK SYNDICATE, LTD., to acquire the invention and rights of J. G. Stüder for the United Kingdom, France, Belgium, Cape Colony, Orange River Colony, Natal and the Transvaal in his patent cavity ventilating hydraulic compressed building blocks and his invention and rights for the United Kingdom for improved glazed brick partitions. Capital: £16,000.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barnes.—For the erection of a cemetery chapel and keeper's lodge, for the Urban District Council. Mr. Reginald B. Rowell, A.R.I.B.A., M.S.A., architect, Triangle Corner, East Sheen S.W., and at 1, Nassau Road, Barnes. Quantities by the architect:—

F. Mark, 51, Bell Street, Edgware Road...	£2,937
W. Hyde, 148, Birchanger Road, Norwood Junction...	2,896
The Sycamore Works, Wimbledon...	2,830
G. Wimpey & Co., Hammersmith...	2,810
Dean & Co., 50, Whitehorse Road, Croydon...	2,780
J. W. Brooking, Richmond...	2,784
W. J. Renshaw, Putney...	2,751
J. Barker & Co., Ltd., Kensington...	2,719
T. Bendon, 48, Chancellor's Road, Hammersmith...	2,695
Myall & Upson, Clacton-on-Sea...	2,670
Millman & Co., High Road, Chiswick...	2,644
Speckley & Smith, Richmond...	2,632
J. Dorey & Co., Ltd., Brentford...	2,610

S. N. Soole & Son, Richmond	£2,600
Wisdom Brothers, Isleworth	2,570
F. & J. Foster, Suffolk Works, Norwood Junction	2,566
E. Wall, Garrett Lane, Tooting	2,524
R. T. Hughes & Co., Ltd.,* Portobello Works, Sheen Lane, Mortlake	2,505
A. G. Crisp,† Walthamstow	—
Stagg & Cox,† Shaftesbury Avenue, W.C.	—

* Accepted subject to the approval of the Local Government Board.

† Received late and not opened.

Barry.—For the erection of a small-pox hospital, for the Urban District Council. Mr. J. C. Pardoe, surveyor 160, Holton Road, Barry:—

J. Prout	£4,029 0 0
H. Fisher	4,020 0 0
D. Davies, Cardiff	3,950 0 0
W. Britton	3,946 5 7
T. Bevan, Penarth	3,870 0 0
H. S. Rendell*	3,792 9 10

* Recommended for acceptance. [Rest of Barry.]

Beckenham.—For the erection of certain extensions to the boys', girls' and infants' departments of the public elementary schools, Arthur Road, for the Education Committee. Mr. John A. Angell, architect:—

Martin, Wells & Co., Vauxhall	£7,015
Patman & Fotheringham, Islington	6,943
G. Parker, Peckham	6,888
F. W. Green, Beckenham	6,792
R. A. Lowe, Chislehurst	6,790
H. Heathfield, Beckenham	6,728
Wallis & Sons, Maidstone	6,712
Holliday & Greenwood, Brixton	6,581
W. H. Hyde, Norwood Junction	6,510
Syme & Duncan, Beckenham	6,490
H. Kent, 17, Albion Road, Lewisham	6,420
C. H. Price, Stoke Newington	6,358
Cropley Brothers, Epsom	6,343
Nightingale, Albert Embankment	6,318
Hawkins & Co., Ashford, Middlesex	6,207
F. & G. Foster, Norwood Junction	6,071
Jones & Andrews,* Beckenham	6,037

* Accepted.

Beckenham.—For the extension of the boiler and engine house, &c., at their electric light works, Arthur Road, for the Urban District Council. Mr. John A. Angell, surveyor:—

Holliday & Greenwood, Brixton	£2,555
Wallis & Sons, Maidstone	2,189
Patman & Fotheringham, Islington	2,173
Cropley Brothers, Epsom	2,159
H. Lovatt, Ltd., West Kensington	2,028
Jones & Andrews, Beckenham	2,020
B. E. Nightingale, Albert Embankment	1,978
W. H. Hyde, Norwood Junction	1,970
H. Kent, Lewisham	1,937
W. Wallis, Balham High Road	1,927
H. Heathfield, Beckenham	1,919
J. Smith & Sons, South Norwood	1,914
F. & G. Foster,* Suffolk Works, Norwood Junction	1,798

* Accepted.

Billingshurst.—For the erection of a new post-office.

Mr. C. H. Burstow, architect, Horsham:—	
W. Joyce, Billingshurst	£1,140
G. Potter, Horsham	1,123
Rowland Brothers, Horsham	1,099
E. Wade, Billingshurst	1,075
Reeves & Port,* Rudgwick	1,037

* Accepted.

Cheshunt (Herts).—For the erection and completion of a new petty sessional court and technical school, for the County Council. Mr. Urban A. Smith, county surveyor, Hatfield:—

L. & W. H. Patman, Enfield	£3,749 0 0
A. F. Almond, Enfield Highway	3,585 0 0
Farren & Son, Earith, Hunts	3,579 18 10
R. Archer, Cheshunt	3,525 0 0
Miskin & Son, St. Albans	3,408 0 0
Jennings & Grenfell, Waltham Cross	3,366 0 0
Raymont & Son, Hertford	3,297 0 0
Almond & Son, Ponder's End, N.	3,275 0 0
Fairhead, Allen & Son, Enfield	3,244 0 0
J. Thomas, Enfield	3,155 0 0
G. Henson & Son, Wellingborough	3,145 1 7
C. Wall, Ltd., Chelsea	3,129 0 0
A. Monk, Lower Edmonton, N.	3,100 0 0
Moss & Co., Southend	3,100 0 0
J. & M. Patrick, Wandsworth, S.W.	3,089 0 0
W. Lawrence & Son, Waltham Cross	3,072 0 0
Kettering Co-operative Builders	2,943 0 0
P. R. Paul,* Waltham Abbey	2,941 9 5

* Accepted.

Chippenham (Wilts).—For the erection of a new school, for the County Council Education Committee. Messrs. Silcock & Reay, architects, 47, Milsom Street, Bath:—

G. Moore	£5,280 0 0
A. Wills & Sons	4,679 0 0
A. W. Long	4,664 18 0
Hayward & Wooster	4,562 0 0
W. Cowlin & Sons	4,557 0 0
Erwood & Morris	4,498 0 0

Downing & Rudman	£4,354 0 0
Jacob Long & Sons	4,243 0 0
E. Lindy	4,178 0 0
E. Chancellor & Sons	4,170 0 0
H. & C. Spaceman	4,035 0 0
A. J. Colborne	3,899 10 0
J. G. Norman,* 62, Victoria Street, Swindon	3,726 13 4

* Accepted.

Crosskeys (Mon.).—For the partial rebuilding of the Waulfaw School, for the Education Committee. Mr. R. L. Roberts, architect, Abercarn, Mon.:—

Davies Brothers, Abercarn	£3,560
J. Jenkins, Ltd., Newport	3,130
E. Williams, Newbridge	3,125
J. H. Leadbeter, Newport	3,099
C. Cooksey, Hereford	2,997
J. Charles, Newport	2,900
N. Bagley, Aberystwyth	2,891
D. W. Richards, Newport	2,889
J. Pritchard,* Pontymlister	2,800

* Accepted.

Handsworth.—For the erection of a sewage pumping station at Holdford Road, Witton, for the Urban District Council. Mr. H. Richardson, engineer and surveyor:—

Contract No. 1.—Storage tanks, &c.	
W. Cunliffe, Birmingham	£5,383 19 3
Yorkshire Hennebique Contracting Co., Leeds	5,147 10 8
Cruwys & Hobrough, Gloucester	4,647 11 0
Howe & Co.,* West Hartlepool	3,411 6 0

[Engineer's estimate, £5,220 13 9.]

Contract No. 2.—Rising main, sewers, &c.

E. Boore, Smethwick	2,067 2 11
Currall, Lewis & Martin, Birmingham	1,618 0 0
Sutherland & Thorpe, Smethwick	1,569 17 9
W. Cunliffe*	1,518 2 0

[Engineer's estimate, £2,030 7 7.]

Contract No. 3.—Buildings.

E. Boore	1,972 16 3
Currall, Lewis & Martin	1,918 5 4
W. Cunliffe	1,807 1 3
W. Hopkins, Birmingham	1,620 0 0
T. Johnson, Birmingham	1,603 2 11
T. A. Cole & Son, Selly Oak, Birmingham	1,589 5 3
W. Lee & Sons, Aston Manor	1,580 0 0

G. E. Jackson,* Joinery Works, Oldbury

[Engineer's estimate, £2,098 18 8.]

Contract No. 4.—Machinery and motors.

Tangye's, Ltd.,* Birmingham

[Engineer's estimate, £890.] * Accepted.

Huddershead.—For the erection of a new council school, for the Surrey Education Committee. Messrs. Jarvis & Richards, architect, 66, Victoria Street, London, S.W.:—

Willcock & Co.	£4,375 11 0
Crosby & Co.	4,150 0 0
Johnson & Co.	4,118 0 0
Jenkins & Sons	4,077 0 0
F. Milton	4,022 0 0
Martin, Wells & Co.	4,000 0 0
Chapman & Lowry	3,931 0 0
C. Kemp	3,875 0 0
Haslemere Builders	3,857 3 0
R. Elvy	3,833 12 0
H. Kent	3,824 0 0
Norman & Burt	3,791 0 0
W. J. Renshaw	3,790 0 0
Enness Brothers	3,783 0 0
Hawkins & Co.	3,705 4 8
East & Hyde	3,731 0 0
J. & N. Patrick	3,709 0 0
Moss & Co.	3,670 12 6
J. J. Shopland	3,658 0 0
W. H. Hyde	3,645 10 0
H. Flint*	3,542 0 0

* Provisionally accepted.

London.—For the construction of roads, paths and tramways at the Southern Hospital, for the Metropolitan Asylums Board:—

J. Shelbourne & Co., London, E.C.	£16,500 0 0
E. B. Yewen, Croydon, S.E.	15,900 0 0
E. Iles, Mitcham	15,900 0 0
G. Bell, Tottenham, N.	15,632 0 0
W. Griffiths & Co., London, E.C.	15,500 0 0
Road Maintenance and Sione Supply Co., Gravesend	14,997 0 0
S. Kavanagh & Co., Surbiton Hill	14,853 0 0
W. H. Wheeler, London, S.E.	14,431 0 0
W. Manders, Leyton Green	13,925 4 6
Fry Brothers, Greenwich, S.E.	13,906 0 0
W. Johnson & Co., London, S.W.	13,591 0 0
Cunningham, Forbes & Co., Fleet, R.S.O., Hants	13,276 2 3
T. Adams, Wood Green, N.	11,800 0 0
Grounds & Newton,* Page Green Road, South Tottenham	11,265 0 0

[Architect's revised estimate, £13,605.]

* Accepted.

(Continued on p. xvi.)

Advertising Notes.

Periods of depression in business are often the result of a lessening of activity rather than a diminution of resources.

Appointments Wanted.

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A GOOD STAIRCASE and GENERAL HAND desires Leading or Foreman's place. Accustomed to work from Drawings and Specifications and to the control of men.—HITCHENS, 4, Goldsdown Road, Brimsdown, Middlesex. 1298

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT, 3½ years' varied experience, able to prepare working drawings from rough sketches; surveying, levelling, &c.; moderate salary.—X., 48, Thornton Avenue, Chiswick, W. 1240

ARCHITECT and SURVEYOR'S experienced and capable all-round ASSISTANT desires permanency. Thoroughly well versed in quantities, working drawings, construction, steelwork, details, surveying and levelling. Moderate salary.—H., Preston Villa, Markenfield Road, Guildford. 1238

ARCHITECT and SURVEYOR'S ASSISTANT, A.R.San.I., desires ENGAGEMENT; 10 years' varied experience. Measuring up, contract drawings, details, specifications, knowledge of quantities, surveying and levelling, superintending works.—Box 1278, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1237

ARCHITECT'S Junior ASSISTANT (22½) desires SITUATION. Excellent draughtsman, well up in construction, working drawings, measuring and plotting, specifications. Could assist with quantities. Six years' experience.—S. W. H., Brookdale, Manor Road, Teddington. 1268

ARCHITECT'S ASSISTANT (32), Experienced Draughtman and Designer, specifications and quantities, 55s. Country preferred.—TRAHO, 186, Worpole Road, Wimbeldon. 1237

ARCHITECT'S ASSISTANT (23), six years' Midland experience, chiefly domestic; surveys, working drawings, details, &c.; low salary.—Z., "Ingleside," Olton, Birmingham. 1253

ARCHITECT'S ASSISTANT, 21 years' general and public experience; competent quantity surveyor. First-class references. Salary, 3 guineas.—Box 1261, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1237

ARCHITECT'S ASSISTANT (24) disengaged; competent; working drawings, all details, specifications; assist with quantities, land survey, &c.; moderate salary.—Box 1277, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1237

ARCHITECT'S JUNIOR ASSISTANT (20) disengaged September 4th. Five years' experience. London or country. Working drawings, details, good tracer, colourist, &c. General office routine. Salary 25s.—A. G. S., "Kirkdale," Stanmore Road, Leytonstone, Essex. 1279

ARCHITECT'S ASSISTANT (25), experienced; free after 16th September. Domestic and all work.—J. SUGDEN, "Beeches," Frimley Road, Cambridge. 1297

ARCHITECT and SURVEYOR'S ASSISTANT, 10 years' good all-round experience, desires re-engagement, temporary or permanent.—For reference, &c., write, X. Y. Z., 104, Derby Road, Loughborough Leicester. 1300

ARCHITECT'S ASSISTANT; 4 years' experience; working drawings, details, general work, assist with quantities, good tracer, colourist. Good references. Salary, 25s.—Box 1299, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1302

ARCHITECT'S ASSISTANT, capable, energetic, eight years' experience, seeks re-engagement. Town or country. Salary £2 2s.—LASCELLES, 5, Dovecot Road, Wadworth Common. 1294

ARCHITECT'S IMPROVER (20) desires Engagement. Working drawings, small details, good draughtsman, &c. Small salary.—R. R. H., 6, Cromwell Road, King's Lynn. 1294

BUILDER'S, &c. CLERK OF WORKS ASSISTANT (22); drawing, tracing, knowledge quantities and details; 4½ years in architect's office; certificates, building construction, advanced, 1st freehand, &c.—H. M. N., Thorncroft, Farnham, Surrey. 1243

BUILDER'S WORKING FOREMAN seeks permanency in private or jobbing firm in London district. Well up in all branches, plans, and details. Trade, bricklayer. Good references. Abstainer. Aged 30.—WOOD, 80, Selwyn Avenue, Higham's Park, N.E. 1269

CLERK OF WORKS, good draughtsman, setter-out, sanitary engineering, quantities, seeks position as ASSISTANT; thoroughly practical, trustworthy, and reliable.—D., 9, Lambeth Palace Road, London, S.E. 1242

CRANE or ENGINE DRIVER FITTER, take charge of plant, thoroughly experienced; young man seeks situation.—F. W., 1a, Comboss Road, White Post Lane, Victoria Park. 1276

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GENERAL FOREMAN, just finished contract, wants RE-ENGAGEMENT. Thoroughly competent in all branches. Energetic and reliable. Punctual time-keeper. Excellent London references.—G. T., Netherbrook, Nether Street, Finchley, N.E. 1263

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MACHINIST (24), spindle hand improver; can also work saw bench, band saw, overhead and panel planer; make cutters, sharpen saws.—MACHINIST, 18, Lausanne Road, Peckham, S.E. 1266

PAINTER.—Good all-round hand wants JOB, town or country. Abstainer.—A. R., 43, Bassett Street, Kentish Town, N.W. 1236

PAINTER.—WORKING FOREMAN desires ENGAGEMENT. Good all-round man in all branches of the trade. Refs.; abstainer.—F. R., 43, Bassett Street, Kentish Town, N.W. 1235

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PLUMBER (young), gas, hot-water, zinc, electric bells, well up in the latest sanitary improvements, used to speculating work or good shop.—M., 52, Poplar Walk Road, Herne Hill, London. 1239

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Appointments Vacant.

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ARCHITECTURAL ASSISTANT, pro- ficient in School Work, required at ONCE. Apply, stating age, experience, and salary, and enclosing specimens of work and copies of testimonials, to HENRY T. SANDY, Architect, Stafford. 1269

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DRAWINGS from rough sketches, designs, details, specifications, drain plans and quantities prepared. Terms moderate.—J. W., 8, Rylett Crescent, Shepherd's Bush, W. 1241

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CHURCH SEATING FOR SALE. Tenders are invited for the removal of a large quantity of varnished deal seating, of comfortable pattern and in good condition; a rostrum and other fittings, which are at present at the London Road Chapel, Greenwich. Specification, forms of tender, and full particulars may be obtained from J. F. BULL, Surveyor, 52, Bedford Row, W.C. 1240

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SAWN OAK PARK PALING, 6 inches wide, 4s. 100 ft. run.—MAY and BUTCHER, Timber Merchants, Heybridge, Maldon, Essex. 1240

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R.I.B.A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for syllabus to Mr. A. G. BOND, B.A. Oxon., A.R.I.B.A., 115, Gower Street, London, W.C. (late Howgate and Bond).

PRACTICAL DESIGNING OF STEEL CONSTRUCTIONAL WORK taught by Correspondence, individually or in classes. Elementary and advanced courses arranged for Architects, Engineers, &c. Write for particulars to the **EMBANKMENT ENGINEERING INSTITUTE**, 156, Temple Chambers, Temple Avenue, E.C.

STRUCTURAL STEELWORK Correspondence Classes specially for Architects, Assistants, Surveyors, Builders, and Draughtsmen, by the **MIDLAND ENGINEERING BUREAU**, STRAND, DERBY. Specialists in American and Continental Construction. Thorough Tuition. Send for descriptive booklet J., and read opinions of past students, and press notices, &c.

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TWO FREE SCHOLARSHIPS are offered by the Worshipful Company of Carpenters.

Candidates desirous of sitting for the Examination which will be held on **SEPTEMBER 27th**, at the College, from 7 to 9 p.m., must send in their names to **J. HUTTON FREEMAN, Esq.**, Carpenters' Hall, London Wall, on or before **SEPTEMBER 25th.**

UNIVERSITY COLLEGE, LONDON.

(UNIVERSITY OF LONDON.)
SESSION 1905-6.

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Professor: **F. M. SIMPSON, F.R.I.B.A.**

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Educational—continued.

THE INSTITUTE OF SANITARY ENGINEERS, Ltd.

PRACTICAL SANITARY SCIENCE.

EXAMINATIONS IN PRACTICAL SANITARY SCIENCE, and qualifying for admission to the Institute, and Students' Examinations will be held in London, Birmingham, and Sheffield, on November 24th and 25th, 1905.

Further particulars as to Membership Examinations, Students' Classes, Lectures, &c., can be obtained from the undersigned.

ARTHUR E. ASHBY,

Secretary I.S.E.

19, Bloomsbury Square, London, W.C.

Contracts Open.

UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE.

TO CONTRACTORS, BUILDERS, and Others.

The Council of the University College of South Wales and Monmouthshire is prepared to receive TENDERS for the CONSTRUCTION of the FOUNDATIONS of the proposed New University College Buildings, at Cathays Park, Cardiff, according to the plans which have been prepared by Mr. W. D. CAROE, Architect, of 8a, Whitehall Place, London.

Copies of the plans, conditions, and form of contract may be seen at the Office of the REGISTRAR of the said College, Newport Road, Cardiff, or at the Office of the ARCHITECT, any week day after August 8th, 1905, between the hours of 10 a.m. and 5 p.m.

Copies of the bills of quantities have been prepared by Mr. F. T. MULLETT, of Downing House, Cambridge, and, together with the form of contract for the due execution of the work, may be obtained from the REGISTRAR after August 15th, on payment of a fee of £10s., which will be returned upon receipt of a bona fide Tender.

Neither the said Council nor the undersigned warrant the accuracy of the bills of quantities, nor does the Council bind itself to accept the lowest or any Tender.

The Builder whose tender is accepted must be prepared to find a guarantee for the proper performance of his contract which shall be satisfactory to the Council.

Sealed Tenders should be addressed to the REGISTRAR, University College, Cardiff, in a cover supplied with the quantities, and should be delivered on or before **TWELVE noon, on TUESDAY, August 22nd, 1905.**

Dated this 3rd day of August, 1905.

W. D. CAROE,

8a, Whitehall Place,
London, S.W.

WALLASEY URBAN DISTRICT COUNCIL.

EDUCATION COMMITTEE.

NEW SCHOOLS, St. GEORGE'S RD., WALLASEY.

TENDERS are invited for the whole of the WORKS required in the erection of the above New Schools in accordance with DRAWINGS and SPECIFICATION prepared by Mr. JOSEPH HOLT, A.R.I.B.A., 9, Albert Square, Manchester.

Copies of bills of quantities and general conditions with Form of Tender may be obtained from the Architect's Office, on and after the 14th AUGUST, 1905, on receipt of a deposit of £10s., which will be returned after receipt of a bona fide Tender.

Sealed Tenders marked "Tender for St. George's Road School," to reach me by post, not later than the 16th SEPTEMBER NEXT.

The Council do not bind themselves to accept the lowest or any Tender.

By Order,

Public Offices, H. W. COOK,
Egremont, Cheshire, Clerk and Solicitor.
August 3rd, 1905.

EMPLOYMENT REGISTER.

Too late for Classification.

1294.—ARCHITECT'S IMPROVER (20); working drawings, small details; good draughtsman; small sal.

1295.—PAINTING, DECORATING, &c.; good work; reasonable terms; town or country; estimates given.

1297.—ARCHITECT'S ASSISTANT (25); experienced; free Sept. 16th; domestic and all work.

1298.—STAIRCASE and GENERAL HAND, as leading or foreman; accustomed to work from drawings and specifications, and control of men.

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1303.—JUNIOR ARCHITECT AND SURVEYOR (23); good exp.; ex. refs.; salary £1 to £1 5s.

See p. xx for the Employment Register.

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I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE E.C.

TENDERS - cont. from p. xiii.

Hereford.—For alterations and additions to house on the Whitney estate, for Mr. Peter Coats, of Paisley. Messrs. Groome & Bettington, architects, Palace Chambers, Hereford. Quantities by architects:—

E. W. Wilks	... £1,570	0	0	£152	0	0
W. Powell	... 1,549	12	6	189	8	3
W. P. Lewis & Co.	... 1,490	0	0	181	7	6
Beavan & Hodges	... 1,462	0	0	169	2	0
C. Cooke	... 1,430	0	0	177	6	2

A.—Deductions as per form of tender.
[All of Hereford.]

Kirkburton.—Accepted for the erection of an isolation hospital, consisting of administration, isolation, scarlet fever and laundry blocks, with porter's lodge, providing accommodation for twenty-six beds, for the Kirkburton Hospital Committee. Mr. Joseph Berry, architect, 3, Market Place, Huddersfield:—

Mason—Bentley & Swift.
Joiner—Sam Radcliffe.
Concretor—John Cooke.
Painter—J. W. Jessop.
Plasterer—Broadbent Brothers.
Slater—Allison & Co.
Plumber and Electrician—T. Armitage.
Glazing—W. H. Heywood & Co.
[Approximate cost £9,000.]

Knaphill.—For alterations and additions to mixed school, new infants' school, manual instruction and cookery room, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria Street, London, S.W.:—

Aylott...	... £8,169	2	1
Chinchen & Co.	... 7,711	15	5
Sycamore Works	... 7,647	16	10
J. Shepherd	... 7,511	0	0
Bunning	... 7,368	15	9
Higgs & Outhwaite	... 7,286	0	0
Martin, Wells & Co.	... 7,233	0	0
Gammon	... 7,185	14	10
Mitchell Brothers	... 7,169	0	0
Enness Brothers	... 7,121	9	0
F. J. Shopland	... 7,116	0	0
Hart	... 7,035	2	11
W. H. Hyde	... 7,022	0	0
E. Streater	... 6,972	19	0
F. Deacon	... 6,959	3	0
Drowley & Co.	... 6,951	9	10
Banyard	... 6,920	0	0
East & Hyde	... 6,901	0	0
Cropley & Son	... 6,736	0	0
Turtle & Appleton	... 6,580	0	0
J. & N. Patrick	... 6,464	0	0
W. Watson	... 6,427	0	0
H. Kent	... 6,369	0	0
W. W. Gale*	... 6,266	18	7

* Provisionally accepted.

GROBAK GREEN SLATE QUARRIES.

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London, S.E.—For alterations and additions to the Southwark County Court, for H.M. Office of Works, &c.:—

Leslie & Co.	... £2,537	... £21
J. Mowlem & Co.	... 2,532	... —
J. L. Green	... 2,287	... 30
Smith & Sons	... 2,250	... 30
F. Webster	... 2,220	... 14
W. Shepherd	... 2,217	... 35
A. F. Vigor & Co.	... 2,193	... 10
E. Lawrence & Sons	... 2,155	... 15
F. Gough & Co.	... 2,119	... 30
S. E. Moss & Co.	... 2,105	... 25
J. Chessum & Sons	... 2,104	... 85
J. Shelbourne & Co.	... 2,099	... 41
G. P. Butler & Co.	... 2,067	... 50

Martin, Wells & Co.	... £2,049	... A.
J. T. Robey	... 2,022	... —
Prestige & Co.	... 2,017	... 10
B. E. Nightingale	... 1,988	... —
General Builders	... 1,885	... 39
W. Mills,* St George's Road, Westcombe Park, S.E.	... 1,833	... 10

[A.—Allowance for old materials.]

* Accepted.

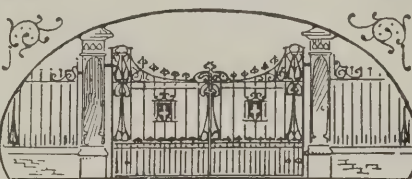
Nuneaton.—For additions to St. Mary's Schools, Abbey Green. Mr. Ernest E. Shepherd, architect, Nuneaton:—

Joseph Smith	... £370	0	0
A. H. Green*	... 368	12	0
A. Beddingham	... 365	10	0

* Accepted.

(Continued on p. xviii.)

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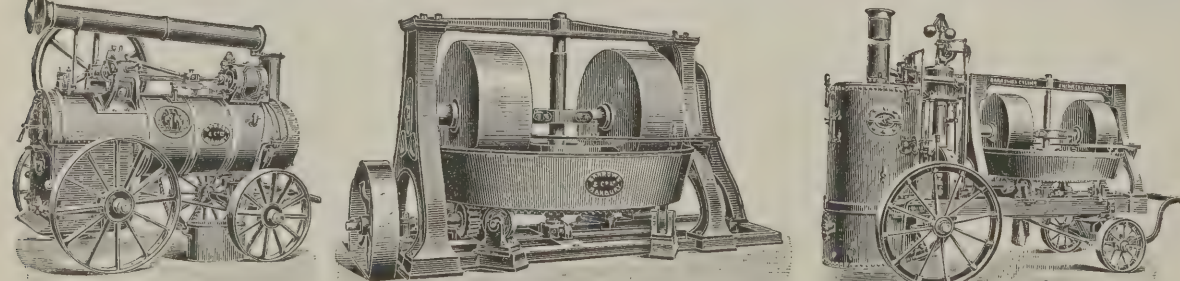
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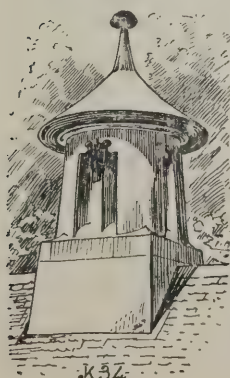
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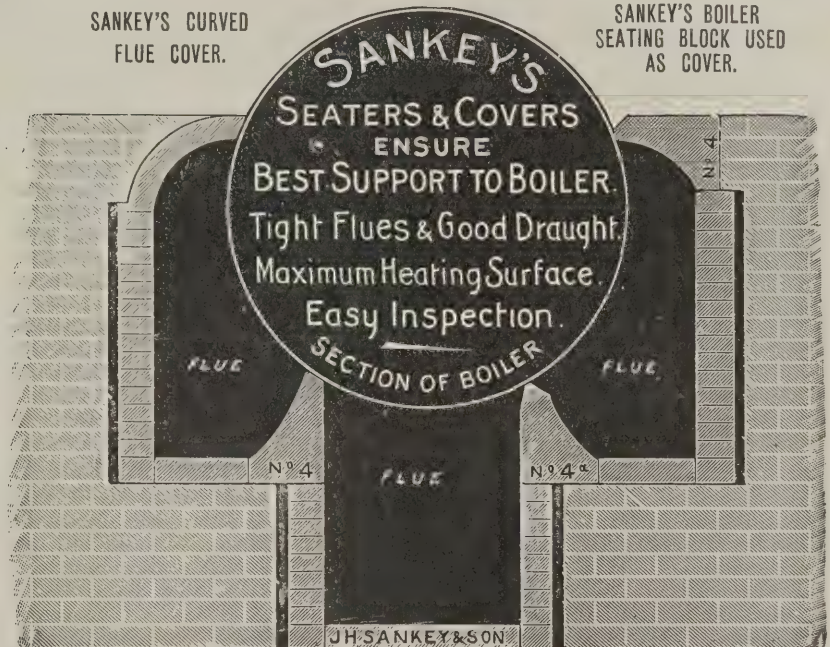
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(See displayed Advt. in issue for August 9, p. ii.)

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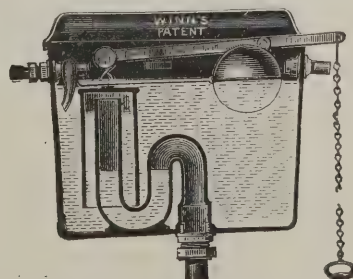
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6, Great New Street, Fetter Lane, E.C.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

August 23, 1905. Vol. 22, No. 550

6, Great New Street, Fetter Lane, E.C.

Summary.

Discussing English and French Gothic, an American contemporary calls the former a picturesque degeneration of the latter, "although the most insular form of the style, the Perpendicular, . . . is as far from being the most picturesque as it is from being the most Gothic." As for picturesqueness, one might as well ascribe to the mediæval English builder the "ivy mantle" which cloaks his tower, or even the moping owl which complains from it to the moon. But the ivy mantle and the moping owl are not architecture. (Page 114.)

An American architect has patented the use of glass for building houses. These glass structures consist of a double steel framework with wire-glass filled in between. Windows are not necessary for light, as sufficient comes through the walls above waistcoat height. (Page 107.)

The new Royal Naval Hospital at Chatham consists of a general hospital accommodating 468 beds and a zymotic hospital for 102 beds. The wards in the former are 120ft. by 28ft. 6ins. and in the latter 48ft. by 25ft. Teak floors are adopted for all the wards, the walls being plastered and finished in Keene's cement and painted either a light buff or green colour. The cost of the buildings has been £330,000, exclusive of furnishing. (Page 102.)

After studying the question of sewage-disposal for eleven or twelve years, Sir Alexander Binnie, C.E., has arrived at the conclusion that as far as possible all solid and floating matter should be removed from the sewage by mechanical means, and that the minute suspended matter still remaining should be reduced by the aid of those organisms with which we are well acquainted from the solid to the fluid state. The success of the London sewage works he attributes to the large volume of water into which the effluent is discharged. (Page 111.)

The "King's Own" Memorial Chapel at Lancaster Parish Church is 67ft. long by 21ft. wide and 24ft. 6ins. high to wall-plate. It has a very fine open-timber roof of oak, with moulded tie-beams with carved bosses, carved curves and tracery panels between queen-posts. A panelled ceiling with bosses at the intersections is formed over the altar. Messrs. Austin & Paley, of Lancaster, were the architects. (Page 110.)

It is said that the bursting of a tank on a tower at Witney, in Oxfordshire, was due to want of uniformity in the adjustment of the stay rods, so that some of them had more than their proper share of the load. It is remarkable that this tank was replacing one which failed under almost similar circumstances. (Page 106.)

Empty Houses in London.

THERE has been a good deal of talk in the daily press recently about the number of empty houses in London at the present moment, and all sorts of explanations have been advanced to account for this apparent abnormal state of affairs. House agents are complaining about the smallness of the business done, but they seem to forget that the number of house agencies has increased altogether out of proportion to the actual requirements. There is, however, a tendency for the wealthier to forsake the large houses in the suburbs, even in those a considerable distance out, just as some years ago they left once popular districts like Bloomsbury and Islington which after a period of lodging-houses are now developing flats. There seems to be no diminution in the demand for smaller houses at rentals of from £30 to £50 per year, but houses from £60 upwards are undoubtedly somewhat a drug in the market. People are disinclined to rent houses at such a figure, and they object still further to purchasing them because most of the houses to which we refer were erected on ninety-nine years' leases, the greater part of which has expired, their value consequently depreciating every year. This is one of the worst features of the leasehold system, and apparently the only remedy for the unfortunate landlord is to either let them at a reduced rental to poorer tenants or allow them to remain vacant. Either alternative is bad enough, because on the one hand the neighbourhood loses tone, while on the other an empty house requires continual expenditure of money to prevent it falling into decay. Several solutions to the problem have been suggested, such as the taxation of ground values and the compulsory purchase of freeholds. Ireland has already been granted facilities in this latter respect, though it seems peculiar that a country which has no housing problem should have been granted facilities for acquiring land while they have been withheld from England. Increased travelling facilities, such as electric trams, tubes and motor buses are responsible for many houses being vacant in London, but a good deal must be put down to the lack of method and common-sense on the part of some builders. For instance, in many districts building operations are being continued when it is palpable that the neighbourhood is already overbuilt, and again we know of at least one suburb where cottages

to let at about 9s. per week are being sandwiched between houses for which rentals of from £30 to £50 are demanded. It is perfectly obvious that these cottages must depreciate the district, especially when free season tickets for one year are offered in order to attract tenants. The logical outcome of such a policy is bound to be that the larger houses are vacated by the better class, who will migrate to a more select neighbourhood, while the places they leave will gradually develop into tenements and probably slums.

A Mistaken Idea.

READERS will recollect that when dealing with the Cheap Cottages Exhibition at Letchworth a few weeks ago we took occasion to point out that the public were likely to be misled into believing that all these had been erected for £150 each, whereas, as we stated, very few indeed have been built for this sum, and in the majority of cases the cost has been largely exceeded. We now find Sir James Crichton Browne expounding vigorously on the false basis in the presidential address which he delivered at the conference of the Sanitary Inspectors' Association held in London last week. At Letchworth, he says, the visitor is able to satisfy himself "that a serviceable and comely cottage, in all respects suitable for a labourer or working man and his family, can be built for £150, including builder's profit . . . Think of a detached cottage, well-proportioned and artistic in design, with a living-room with range 15ft. 6ins. by 11ft. 4ins., parlour with mantel-register 10ft. by 8ft., scullery with bath, hot and cold water, 9ft. 4ins. by 7ft. 6ins., three bedrooms 9ft. high, 13ft. 4ins. by 9ft., 13ft. 4ins. by 9ft. and 8ft. 6ins.; with pantry, two cupboards, coal-hole, shed for wood, w.c., water laid on, drains connected, rainwater butt, floor of scullery and pantry tiled, and say if it is dear at £150." Of course such accommodation at such a price is exceedingly good value, but it is not to be seen at Letchworth, and we therefore desire to contradict such a statement, which is likely to still further mislead the public. Most of the cottages at Letchworth have cost more than £150, exclusive of builder's profits and architect's fee, so that when Sir Crichton Browne speaks of all these, together with water-supply and drainage, as provided for the sum named we feel it is about time that some protest were raised.



ROYAL NAVAL HOSPITAL, CHATHAM: SOUTH FRONT. JOHN C. T. MURRAY F.R.I.B.A. ARCHITECT.

Photo: Eastmead, Rochester.

THE NEW ROYAL NAVAL HOSPITAL AT CHATHAM.

THE new Royal Naval Hospital at Gillingham, Chatham, which His Majesty the King opened on July 26th, and which we illustrate in this issue, is situated on a site with an average level of 220ft. above Ordnance datum and an area of about 29 acres. The subsoil is chalk, which forms an excellent foundation for the buildings. Red-brick facings and Doulting stone dressings (from the Ham Hill quarries, Norton, Somerset) are used throughout. The internal facing of walls not plastered or finished in glazed bricks is in picked stock bricks, dis-tempered or lime-whitened.

The general hospital is built on the pavilion plan, all the pavilions and the kitchen, stores, operating-rooms, dispensary, recreation- and waiting-rooms, administrative block and basement store-rooms being connected by a corridor.

The zymotic hospital is also on the pavilion plan, but is so arranged that all pavilions and offices are isolated from one another, access to the various buildings being gained by means of covered ways having open sides. The zymotic hospital is a self-contained establishment and is entirely separated from the general hospital.

Under the connecting corridor in the general hospital and under the covered ways in the zymotic hospital are large subways for steam, water and gas pipes, electric-light cables, electric-bell and telephone wires, &c. The basements under all the general hospital pavilions are used as stores; they are reached from the ground floor by staircases of Portland stone and by electric passenger lifts.

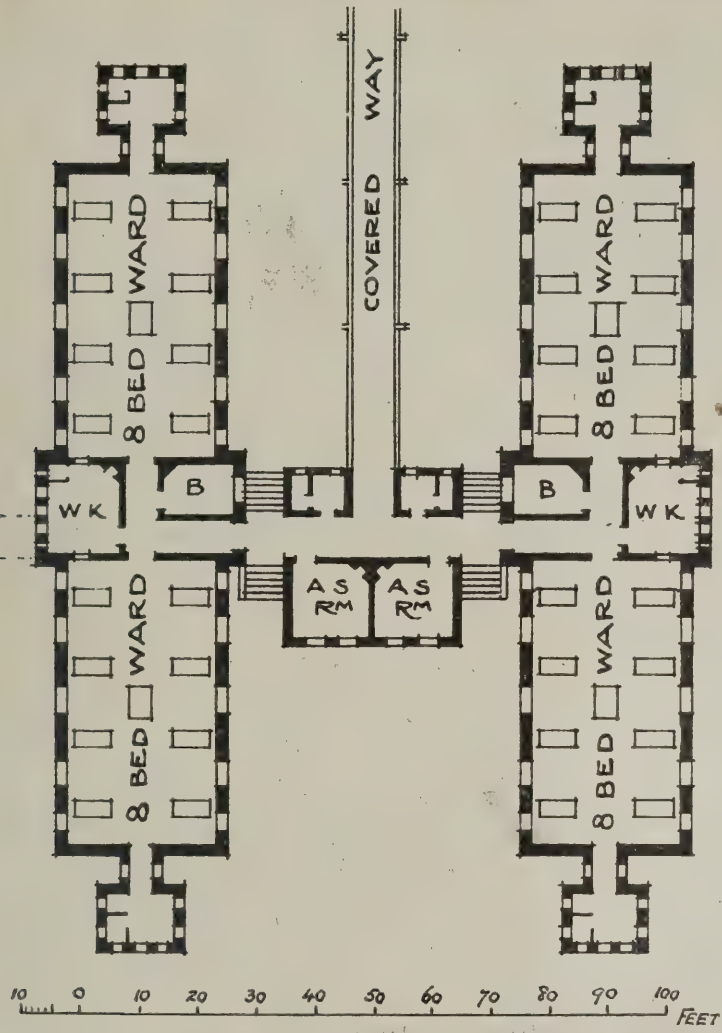
There are no basement store-rooms under the pavilions of the zymotic hospital, these having a large open space formed below the ground floor for the free circulation of air.

The Wards

in the general hospital have accommodation for 468 beds and in the zymotic hospital for 102 beds—a total of 570 beds. The large wards in the general hospital are 120ft. long by 28ft. 6ins. wide and in the zymotic hospital 48ft. by 25ft. The floors of all wards are of teak, secret-nailed and polished. The floors of all passages, corridors, lavatories, bathrooms, main kitchens and sculleries,

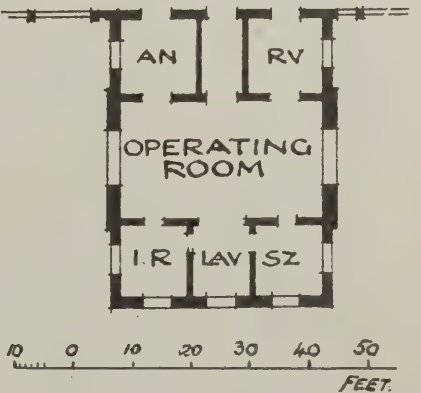
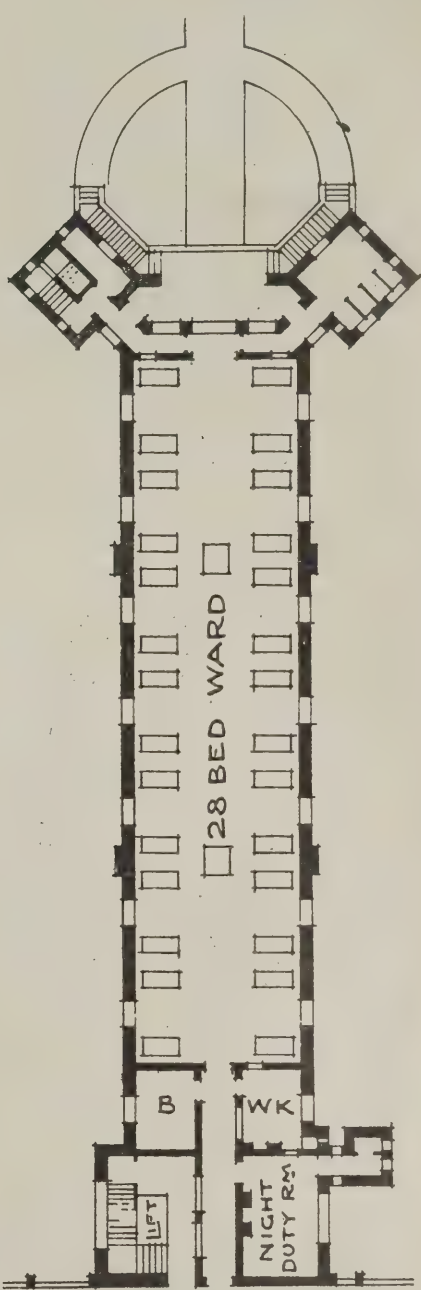


MAIN ENTRANCE TO ADMINISTRATIVE BLOCK.



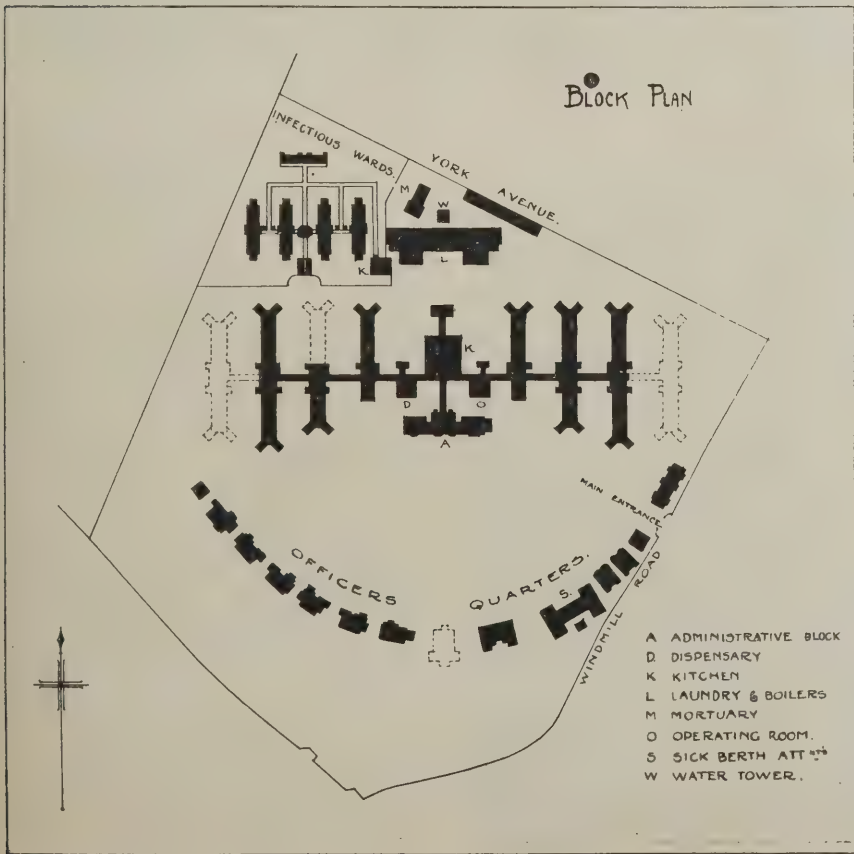
PLAN OF WARDS IN INFECTIOUS DISEASES HOSPITAL.

These twin wards are repeated on either side of a covered way having a central staircase.



PLAN OF ONE OF THE SURGICAL WARDS.

THE NEW ROYAL NAVAL HOSPITAL AT CHATHAM.
JOHN C. T. MURRAY F.R.I.B.A., ARCHITECT.



verandahs and balconies are of concrete, finished with marble terrazzo. The ground-floor wards have concrete floors with wood angle fillets embedded as a fixing for the teak flooring. The first-floor wards are carried on wood and rolled steel joists. The teak floors are polished throughout with "Ronuk." The ward walls are plastered and finished in Keene's cement and painted either a light buff or green colour.

Warming and Ventilating.

The system of warming and ventilating the wards is as follows:—In a certain number of window backs in each large ward and in the window back of each small ward is a small steam radiator, which is enclosed with a movable panelled mahogany front and a polished oak window board, each of which is covered on the inside with asbestos mill-board. Fresh air is admitted to these radiator chambers by means of gratings and flues in the outside walls, and the air, when warmed, is conducted to the wards by means of fire-clay flues built into the walls on each side of the windows and finished with adjustable inlets fixed 6ft. 6ins. above the floor.

The vitiated air is carried off by means of flues in the walls with outlet gratings just above floors and under ceilings, the flues being continued up chimney shafts or connected to steel trunks in roofs. The ventilating flues in chimney shafts and the steel trunks are finished with Truss extract ventilators.

In addition to the heating of the hospital buildings throughout by steam radiators and coils, each ward has central open coal-fire stoves.

Glazed Brickwork.

The walls of lavatories and latrines, as well as the main kitchens and sculleries, are faced with white-glazed bricks for a height of about 7ft., and the walls of all sink rooms and cleaning gear rooms are faced with salt-glazed bricks; also the dispensary. The main operating-room is faced with white-glazed bricks from floor to ceiling.

The baths in the hospitals are of white-glazed stoneware fitted with hot and cold water valves and a spray and douche fitting, and arrangements are also made in each bathroom for filling and discharging movable baths.

The first-floor wards in the general hospital are approached by Portland stone stairs with an electric lift in the well of each.



ROYAL NAVAL HOSPITAL, CHATHAM: NORTH FRONT OF ONE OF THE PAVILIONS IN GENERAL HOSPITAL.

Emergency stairs are also provided in the angle towers. In the zymotic hospital the first-floor wards are approached by two flights of stairs, situated in a detached staircase building in which are also two lifts.

The Operating Theatre and the Dispensary

in the general hospital are situated midway between the clock tower and the eastern and western pavilions. Both these rooms are top-lighted in addition to the ordinary windows, which, in the operating theatre, are of polished plate glass in gunmetal frames. The fittings in the dispensary are of mahogany and teak. The zymotic hospital is also provided with a small operating theatre and a dispensary.

The cooking apparatus in the kitchens is supplied by steam, with the exception of gas-ovens and grilles. There is also a small ward-kitchen with a cooking-range attached to each ward. Hot water is provided to all baths, lavatories, sinks, &c., by means of steam calorifiers in the basements of pavilions.

The Administrative Building

is situated on the south side of the general hospital, with which it is connected by a corridor; it contains board and survey rooms, offices for medical officers and staff, together with ophthalmic, X-ray and dark-rooms for photography. On the first floor of this building are a general laboratory, research room, pathological museum and medical library.

The sick-berth staff quarters provide accommodation for fifteen first-class stewards and



A WARD.

Photo: Morehen & Co.



ROYAL NAVAL HOSPITAL, CHATHAM: EASTERN ENTRANCE TO GENERAL HOSPITAL.

ward masters, 104 sick-berth attendants, and twelve night nurses. The building contains a kitchen, scullery, stores, recreation-room and mess-room, in addition to two large barrack-rooms and a number of cubicles.

Twelve houses and six cottages are provided to accommodate the general hospital staff; and one house for sisters, quarters for surgeon and ward master, and barrack-rooms for sick-berth attendants are provided in the zymotic hospital.

Mortuary and Laundry Buildings.

Separate mortuary buildings are provided for the general and zymotic hospitals, to the latter of which is attached an incinerator. The incinerator for the general hospital is situated in a small building at the base of the water tower. The general hospital mortuary contains a pathological laboratory and a small chapel.

In the laundry buildings are five boilers, each 24ft. long by 7ft. diameter—three providing steam for general heating, cooking and hot-water supply, and the remaining two boilers supplying steam to the laundry and dynamo engines, pumps, and washing and ironing machines.

Water-supply and Drainage.

The whole of the water-supply to the hospital is obtained from the local water company, and all water will be softened, except that used for gardens and roads and in case of fire. The water, after leaving the

softener, will be pumped into the tanks in the water tower and thence distributed to the buildings. Two large underground water tanks are also provided for the storage of rainwater, their total capacity being 70,000 gallons; this water will be used in the laundry.

For the drainage of the hospital there are two systems of sewers, one for soil and one for surface water, both connected to the Gillingham Corporation's sewers and storm-water drains. All soil drains are executed with Archer's patent joints, while the surface-water drains have ordinary joints. No surface water from the roofs of the zymotic hospital buildings is stored; and both the soil and surface-water drains from this establishment are connected to the Corporation's sewers separately from the general hospital drains. Disinfecting arrangements are provided in the case of all soil drains from the zymotic hospital.

Lighting.

Electric light has been installed throughout the hospital. Current is obtained from the Gillingham Corporation's generating station and transformed from an alternating to a continuous current by means of three motor generators in the dynamo-room of the hospital. Two sets of engines and dynamos are also being put down in the dynamo-room so that current can be generated in the event of a breakdown of the Corporation plant.

Offices and shops for the accommodation of the works department have been provided, as well as a chapel, and a stable for a steam lorry and ambulance trailers.

The total cost of the buildings, as now completed, is about £330,000, exclusive of furnishing.

Mr. John C. T. Murray, F.R.I.B.A., of 21, Old Queen Street, S.W., was the architect, and Sir Henry Pilkington, R.E., the civil engineer-in-chief; the work having been carried out under the superintendence of Mr. S. P. Brinson, Admiralty architect. Readers will agree that the buildings mass well together and that the design throughout is good, especially the main front to the administrative block.

The general contractors were Messrs. Perry & Co., of Tredegar Works, Bow, E. The heating and hot-water supply contract was executed by Messrs. Strode & Co., of Osnaburgh Street, London, and the electric lighting by the Alliance Electrical Co., of Grafton Street, London.



MAIN KITCHEN.

Photo: Morehen & Co.



ROYAL NAVAL HOSPITAL, CHATHAM: CLOCK TOWER AND DAY AND RECREATION ROOMS.

only propose to devote two days to measuring you can only attempt a small portion of a building. One bay of the cloisters of Worcester Cathedral, one of the Decorated chapels at the east end of Tewkesbury Abbey or the ruined Perpendicular chapel in the church of St. Lawrence at Eavesham would be suitable subjects for your purpose. In order to give a wider choice of subject the following places are mentioned:—Elmby Lovett, Hanbury, Stoke Prior and Tidmington contain Early English churches; Alvechurch, Hagley and Whitford contain Decorated churches; while fine churches of the Perpendicular period are to be found at Great Hampton, Kidderminster and Upton Warren.

H. Y. M.

The Design of Water Tanks.

[At Witney, in Oxfordshire, a new water tank has been erected on a tower in the place of an old tank which burst eighteen months ago. The new tank was filled one evening last month, and the next morning, following the example of its predecessor, it burst. The whole of the front of the tank was torn away. A correspondent asks for an explanation of this. We give Professor Adams's reply below.]

The tank on brick tower, of which an illustration was sent by a correspondent, is of cast-iron and was made by Messrs. Mather & Platt. It is 31ft. by 31ft. by 10ft. deep, having a capacity of 60,000 gallons. It had just been completed, and was being filled with water on July 20th, when one side burst out, the tank being only about three-fourths full. The failure is said to be due to want of uniformity in the adjustment of the stay rods, so that some of them had more than their proper share of the load. The broken parts are now being renewed. It is a remarkable fact that this tank is being erected to replace a wrought-iron tank of the same area, but 13ft. 6ins. deep with a capacity of 80,000 gallons, which failed under almost similar circumstances on February 22nd, 1904. This was made by Messrs. Rowell & Sons, of Chipping Norton, under the supervision of Mr. George Winship, F.G.S., consulting engineer, of Abingdon, and from its external appearance after the failure appeared to be insufficiently stayed. Local authorities ought by this time to be aware that tank designing is work for a specialist, and that initial economy may mean final disaster.

HENRY ADAMS.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Concrete Garden Frames and Edging.

DUBLIN.—GARDENER writes: "What is the gauge for mixing concrete for walls for garden frames about 12ins. thick and 2ft. high; also for garden edging 3ins. wide by 6ins. high?"

For garden frame walls 7 of large aggregate to 1 of Portland cement is ample. This can be plastered or rough-casted in cement. For garden edging we suggest 4 shingle, 1 sand and 1 of cement.

Buildings to Measure around Worcester.

PLYMOUTH.—REGULAR READER writes: "Please name some buildings in and around Worcester suitable to measure (in two days) for the R.I.B.A. testimonies of study."

The examiners of the R.I.B.A. prefer drawings of a complete building, but as you



MAIN ENTRANCE HALL AND CORRIDOR.

Photo: Morehen & Co.

MEMORIAL ARCH AT CHATHAM.

THE Royal Engineers' memorial arch at Chatham, illustrated on this page, was unveiled by His Majesty the King recently. The design is by Mr. E. Ingress Bell, F.R.I.B.A., and is carried out in Portland stone of a specially selected quality.

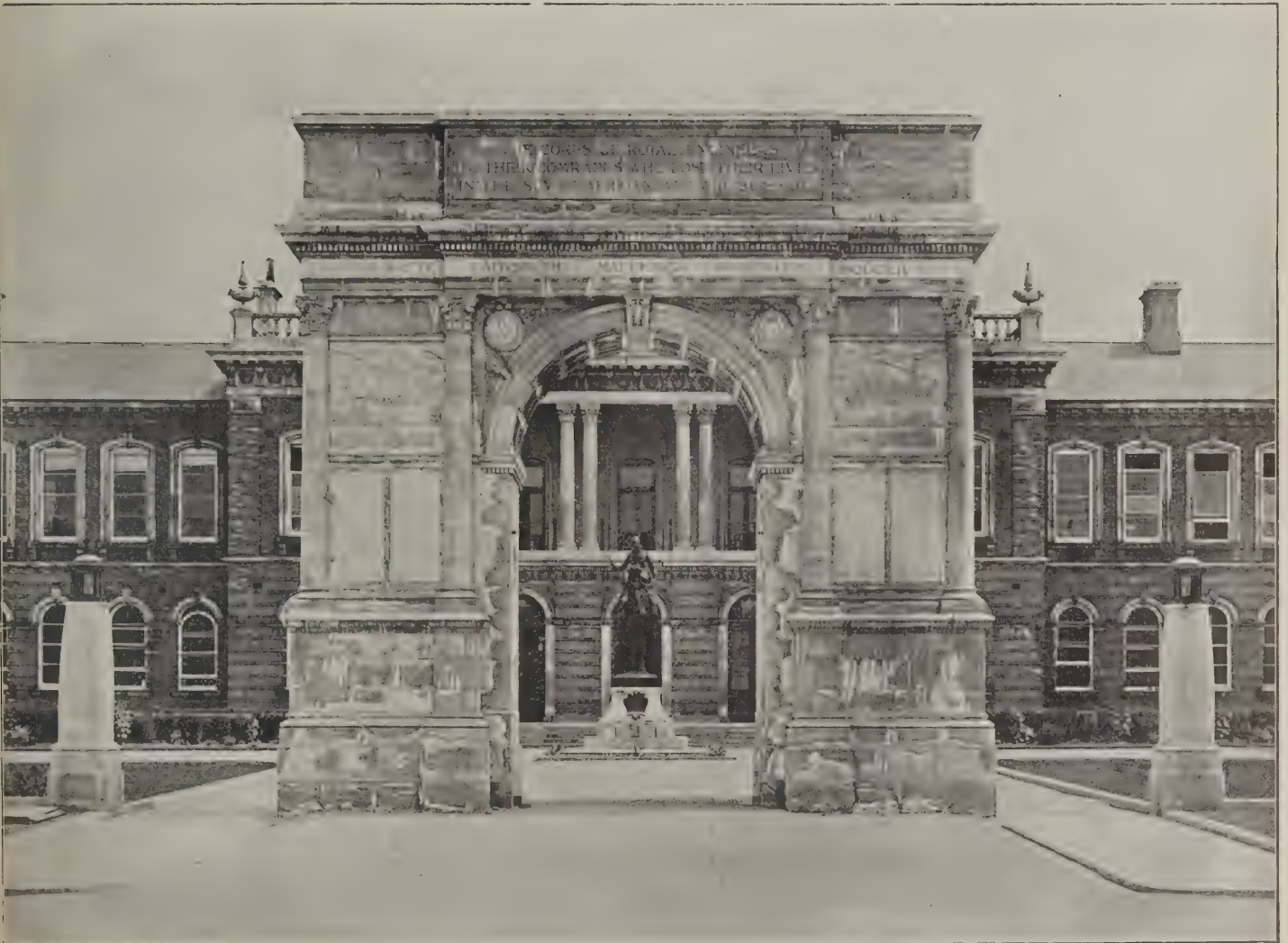
The arch stands in a square or "place" which has been formed between the inner parade of Brompton Barracks and the forecourt of the Royal Engineers' Institute, and faces the Crimean Memorial Arch. In the four re-entering angles of the "place" the large bronze statues of Boers, lent by Lord Kitchener, have been temporarily erected on suitable pedestals, and Burmese and Boer

On a large panel above the arch an inscription records the circumstances of the erection of the memorial.

The friezes which run round the structure are of Istrian marble, and inscriptions filled in with lead give the names of the sixteen actions for which clasps were awarded with the war medals. The broad piers at the abutments of the arch have Istrian marble tablets, on which are recorded in leaded letters the names of the officers, warrant officers, non-commissioned officers and men (about 420) of the regular, militia and volunteer Engineers who lost their lives in the South African War. On one of the inner faces of the archway a similar tablet gives the titles of the various units of the

HOUSES BUILT OF GLASS.

MR. C. E. EASTMAN, a well-known architect of Des Moines, Ia., has just patented the use of glass for building houses, office buildings, hotels, &c. These glass structures consist of a steel framework supported by brackets attached to the beams of the floors, in duplicate, making two walls of opalescent wire-glass, the glass being set in the steel framework. The glass walls are approximately 1 ft. apart. This system of construction allows of any arrangement of floor plan, because windows are unnecessary, the light coming from the walls being sufficient even in the most thickly-built portions of a city where the buildings crowd



THE ROYAL ENGINEERS' SOUTH AFRICAN WAR MEMORIAL ARCH AT CHATHAM. E. INGRESS BELL, F.R.I.B.A., ARCHITECT.

cannon have been placed on the flanks of the two memorial arches. A principal feature of the structure is a series of sculptured panels in high relief showing:—(a) A typical blockhouse with barbed wire defences, telegraph lines and accessories; (b) a movable ox-wagon blockhouse; (c) a pontoon bridge with a team of wagons crossing it, and a military balloon in the background; (d) a destroyed railway bridge, with an armoured train running over a diversion in the bed of the river. All these have an historical value inasmuch as they are based upon photographs of the actual incidents and scenes. Two other panels, representing Paardeburg and Wagon Hill—where the Engineers particularly distinguished themselves—are required to complete the series.

Engineers that served in the war; and it is proposed to inscribe on a companion tablet on the opposite wall the fact that the memorial was inaugurated by His Majesty King Edward VII. as colonel-in-chief of the corps.

The alto-relievos are by Mr. W. S. Frith. The composite capitals to the columns, the keystones of the arches (figures of Victory), and the spandrels containing representations of the medals for this campaign, are the work of Messrs. Fagan & Bell. The marble tablets and inscriptions are by Messrs. Farmer & Brindley, and the copper lamps on the detached piers are by Messrs. Thomas Elsley & Co., Ltd. The general contractors were Messrs. Longley & Co., of Crawley, Sussex.

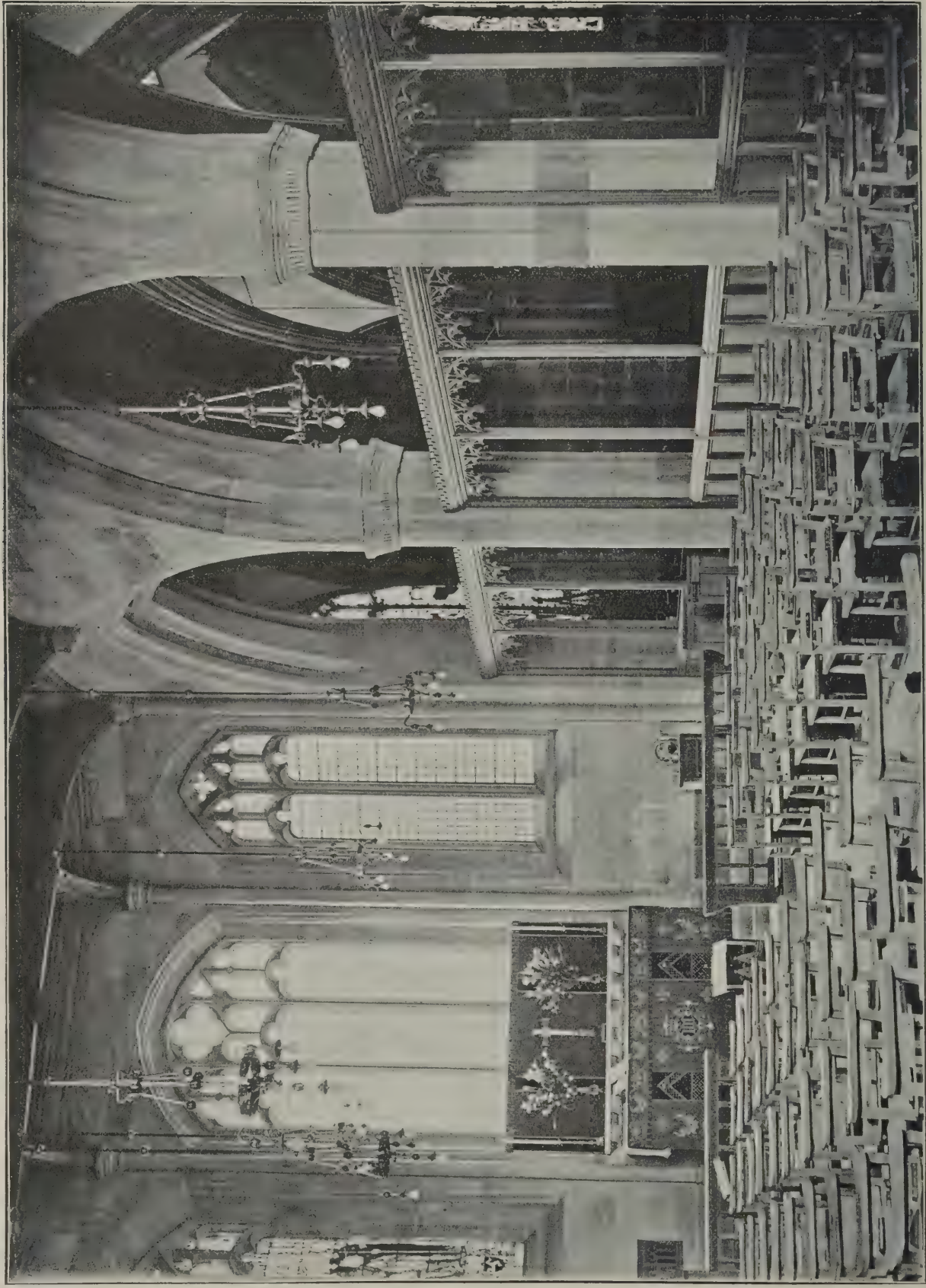
close upon one another and so block out the sunlight. For the same reason the exterior will admit of any style of treatment entirely free of the restrictions of fenestration. The inside treatment allows of a wainscoting half way to the ceiling, with glass over, so that wall-space is available for desks, counters, shelving, &c., on all sides of a room. If an outlook is desired, a portal of plate-glass of one thickness can be placed in the wall, or the columns in the treatment of the exterior can be of plate-glass forming bays. The cost of these glass buildings, compared with stone, terra-cotta or brick, is stated to be from a quarter to a third less for the outer walls; while the inner construction of the building is similar to that in general use, either in steel or masonry.



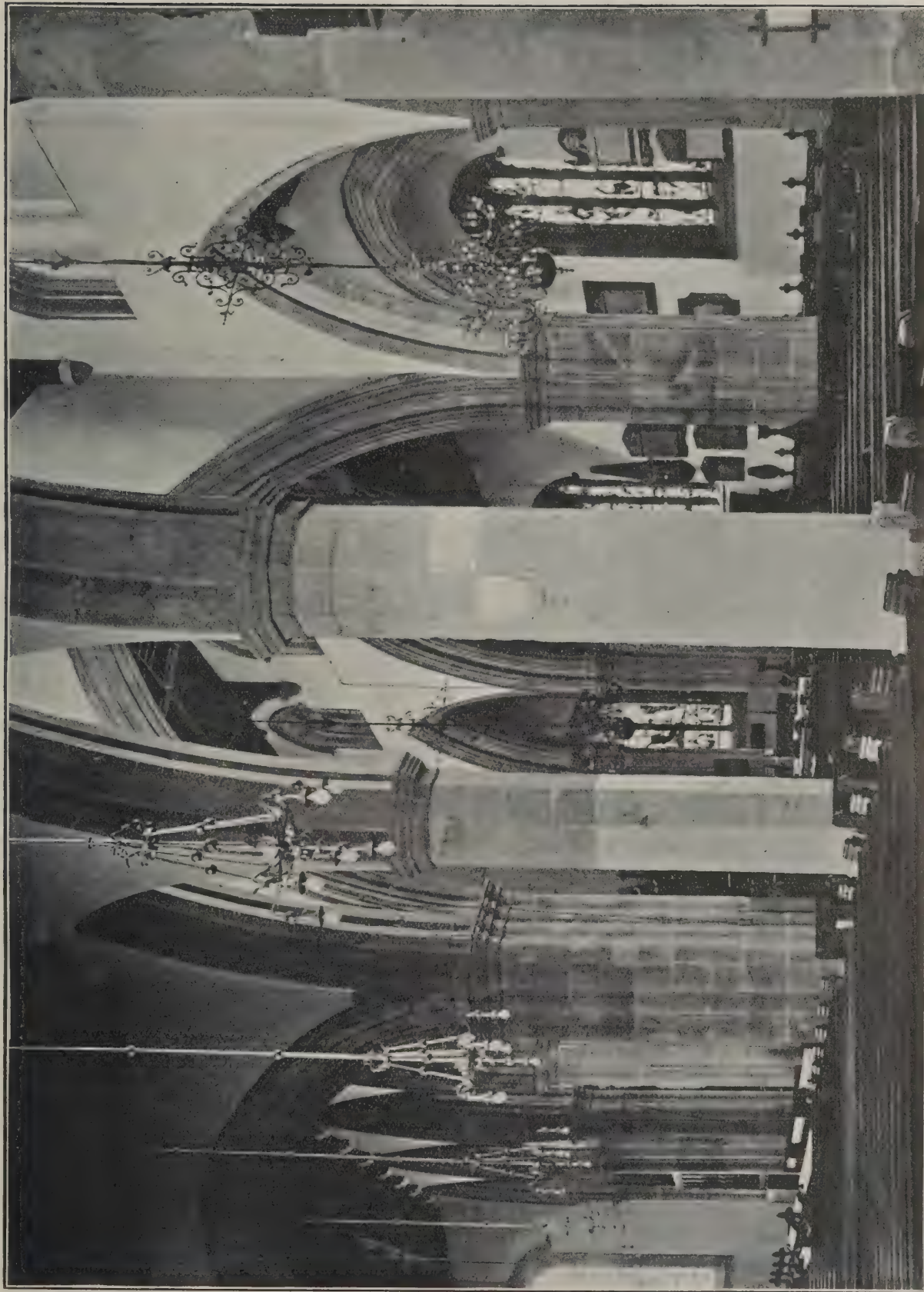
Photo: T. Lewis.

"OUSEFIELD" FULFORD YORK. WALTER H. BRIERLEY ARCHITECT.

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"THE KING'S OWN" MEMORIAL CHAPEL, LANCASTER PARISH CHURCH, LOOKING EAST. AUSTIN AND PALEY ARCHITECTS. Photo: T. Baines.



ST. MARY'S CHURCH, LANCASTER: VIEW FROM NORTH AISLE, LOOKING EAST. AUSTIN AND PALEY, ARCHITECTS.

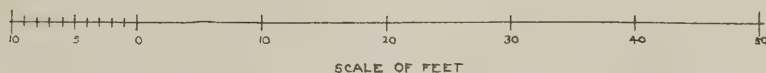
Photo: T. Haines.

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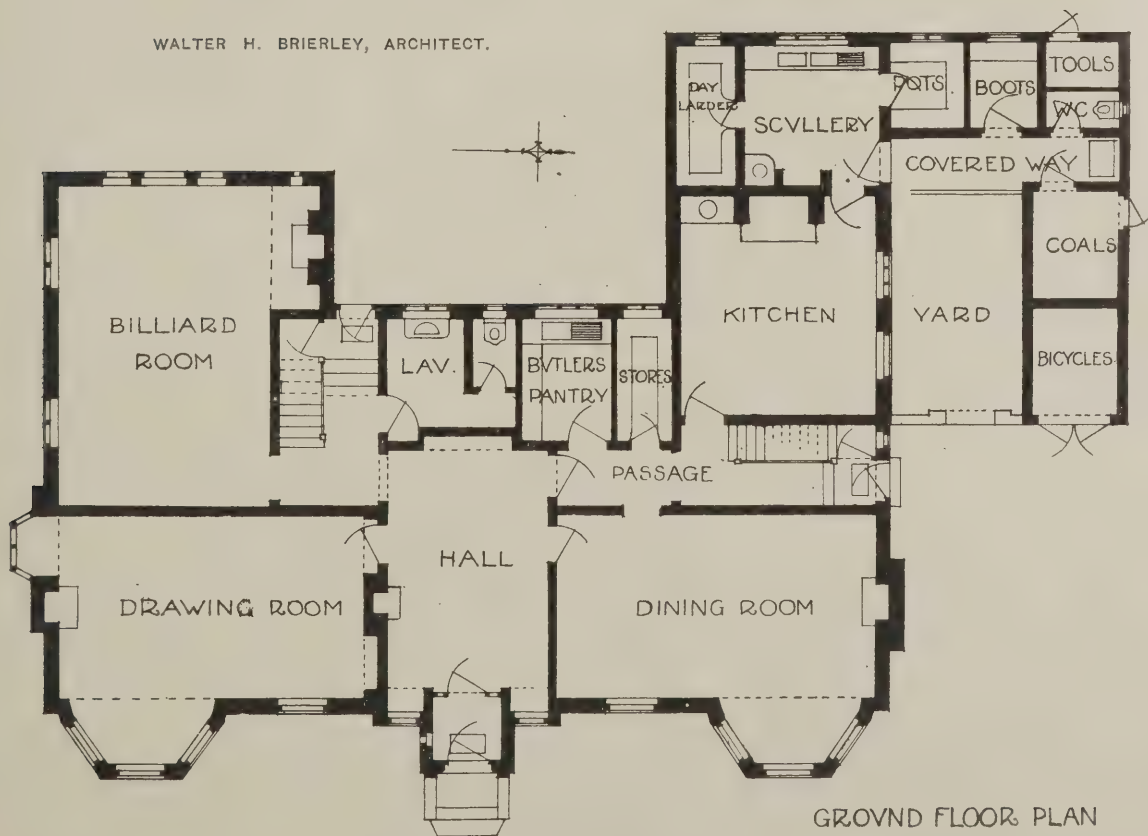
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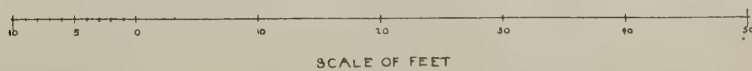
FIRST FLOOR PLAN



WALTER H. BRIERLEY, ARCHITECT.



GROUND FLOOR PLAN



Correspondence.

Tests on Timber.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Referring to the interesting results of tests on timber scantlings published on p. 81 of your issue for August 9th, may I point out that by an obvious error the headings "lbs." and "tons" to columns 1 and 2 of the table should be interchanged.

Commenting upon the results of the experiments, one is struck by the fact that the moduli of rupture given by Sir John Anderson, deduced by testing specimens 2ins. by 2ins., are from 62 to 90 per cent. greater than those obtained at the Bradford Technical College by breaking 12in. by 9in. pieces of the same length.

The discrepancy may be partly accounted for by the great temptation there is in experimenting with small scantlings to select only the best and straight-grained pieces, whereas the larger scantlings are much more likely to approximate in quality to those used in practice. Hence the superior value of such large-scale tests as those you publish.

In conducting these experiments it is unfortunate that no record is given of the percentage of moisture contained in the pieces tested.

Prof. Hudson Beare, in a lecture given at Carpenters' Hall on May 3rd, 1900, pointed out that the percentage of moisture influences the breaking strength of wood to a very large extent, the drier pieces invariably giving a higher breaking strength, both in compression and in bending tests. The increase of strength is most marked in compression, those woods which contain only 12 per cent. of moisture being, as a rule, about 75 per cent. stronger than the same woods when green.

The rate at which the load is applied is also an important factor in determining the breaking strength. By maintaining the load upon a beam for a very long time it has been found that failure will occur under a load representing only 60 per cent. of that required when quickly applied.

In any future experiments it would, therefore, seem highly desirable to ascertain and publish not only the percentage of moisture in the specimen at the time of fracture but also the rate at which the load is applied.—Yours truly,

HAROLD BUSBRIDGE.

PLUMSTEAD.

Cheap Cottages Exhibition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Mr. Baillie Scott's reply to "X" will probably be sufficient for that gentleman; but others of the so-called extravaganzas in Mr. Scott's cottages are surely as absurd as the imaginary rough-cast on the chimneys. For example, "X" mentions the "expensive paving to front entrance," by which he presumably means the rough cobble paving with pattern formed in white stones—the materials for which were picked up, I believe, by the builder on and around the site!

"The huge proportion of roof," which is such a terrible expense in the eyes of "X," is really economical when the whole of the bedrooms are obtained in the roof space; as the usual waste of roof space (when the eaves are kept up to the height of the bedroom ceilings) is therefore avoided.

"X" seems to think that the dressers ought to be included in the competition amount. Why not the old oak furniture, window blinds, &c., as well?

I should think Mr. Scott will consider "X's" letter one of the highest compliments he has received on his houses.—Yours truly,

A. EDGAR BERESFORD.

ALDERLEY EDGE.

Keystones.

The new County and Grand Stands on Stockton Racecourse have been completed. The alterations and additions include new luncheon-, kitchen-, and stewards' retiring-rooms. The architects were Messrs. Mangnall & Littlewood, of Spring Gardens, Manchester.

Mr. Sydney A. Smith, hon. secretary of the Surveyors' Institution junior meetings, is about to pay a business visit to America and Canada, but during his absence all letters connected with the junior meetings for the ensuing session addressed to him at 22, Chancery Lane, London, will receive due attention.

The new Library at Glenalmond College is being constructed of stone obtained within the college grounds, Craiglea slates being used for the roof. The contractors are:—Builder, Mr. Robert M'Ritchie, Crieff; joiner, Mr. William M'Quibban, Perth; slater, Mr. Alexander Eadie, Methven; plasterers, Messrs. A. M'Ritchie & Son, Dundee; glaziers, Messrs. G. R. Douglas & Son, Perth. Mr. A. G. Heiton, of Perth, is the architect.

The Royal Theatre, Halifax, has undergone transformation. The proscenium front has been entirely remodelled; the fronts of the dress circle and gallery are new, a fresh scheme of colouring has been adopted, and the ceiling has been raised. New dressing-rooms, refreshment buffets and smoke-rooms have also been provided. The work has been carried out, at a cost of about £4,000, by Messrs. Waring & Gillow, under the supervision of Mr. A. Beedle, from the designs of Mr. J. J. Coventry; the electric lighting being by Messrs. Stafford & Co., under the direction of Mr. John Pell.

St. Mark's Church, Harrogate, is approaching completion. At present the building consists of nave and chancel. The former cost £9,000 and the latter £6,500. A tower is to be added. The building is being constructed of Pateley stone, from the designs of Mr. J. Oldrid Scott. The east window was executed in stained glass by Messrs. Powell & Sons, of Whitefriars, London. The clergy desks and choir stalls, which are of carved oak, are the work of Mr. R. Bridgeman, of Lichfield, while the stonework which adorns the chancel arch, the arches of the organ-chamber and side chapel are the work of Mr. John Baker, of London.

Norton and Lenchurick Parish Church is to be restored. The building was first restored about the year 1840-41, when a ceiling of lath and plaster was added. It is now proposed to remove this ceiling, which has become unsafe in several places, and to uncover the old rafters. It has been found necessary to include in the scheme the unroofing of the nave, as several of the stone tiles are falling from their places, having been secured by wooden pegs; these will be replaced with copper nails. The plaster on the walls will be stripped off to reveal the quoin stones of the windows and arches. It is hoped that new choir-stalls and seats in the nave may be provided, as the present ones are unsafe and unsightly owing to dry rot.

Ventilation of Cowsheds.—In a paper on "Some Points connected with the Sanitation and Management of Dairies and Cowsheds" which he read before the conference of the Sanitary Inspectors' Association held in London on Thursday last Dr. William Daley, of Bootle, said that the practical difficulties connected with the efficient ventilation of cowsheds could not be overcome if the air-space of the shippon were less than 600ft. per cow, but a well-ventilated shippon with this amount of cubic space was infinitely more wholesome than one with twice its capacity if not properly

ventilated. Cubic space would not compensate for ventilation. A healthy cow would stand any amount of incoming air near its head, but if the openings were so arranged that the air struck the animal near its hind-quarters, then injurious effects followed, with the result that the cowkeeper often blocked up the offending ventilators.

OUR PLATES.

THE "King's Own" Memorial Chapel at Lancaster Parish Church has been built at the north-west corner of the building. The north aisle wall has been taken down, the roof propped, and a new arcade of four bays inserted; these have moulded piers with moulded caps and bases, and the caps have a raised inscription in Latin taken from the "Benedicite," which is cut in the bell of the caps. The old windows and buttresses and base-course of the aisle have been most carefully taken down and rebuilt in the north wall of the new chapel, a parapet has been added, and most of the old building stones have been re-used in the external facing. The chapel is 67ft. long by 21ft. wide and 24ft. 6ins. high to wall-plate. The east end has an octagonal apsidal termination with circular shafts in the angles inside, which run up and support the drop rafters of the roof. In this end are a central three-light window and two side windows of two lights each. In the west gable is a tracery-headed five-light window, below which is the arched entrance doorway, screened on the inside by oak inner screen doors. A feature has been made at this end by an octagonal turret at the junction of aisle and chapel. This is carried up 36ft., the winding stairs having access to the roof gutters, &c. The chapel has a very fine open-timber roof of oak, with moulded tie-beams with carved bosses, carved curves, and tracery panels between queen-posts. A panelled ceiling with bosses at the intersections of the ribs is formed over the altar. The roof is covered with green slates and the chapel is lined inside with ashlar stone facing above a panelled oak dado. The aisle passages are laid with flags, the seat sections being laid with oak blocks. The sanctuary floor is laid with red and white marble in pattern. The retable in the east wall is of alabaster with carved paterae under the shelf. Between the arches are open screens of oak with tracery heads and moulded cornices and posts. The heating of the chapel is by low-pressure hot water and the lighting by electric pendants hung from the roof beams, the latter matching those in the church itself. The accommodation is for 150 worshippers. Chairs are provided for present requirements. The altar table, altar rails, litany desk and credence table are all of oak and have been designed by the architects, Messrs. Austin & Paley, of Lancaster. The work has been carried out by the following firms:—Masonry, J. Thoms; joinery, J. Hatch & Sons; plumbing and glazing, R. P. Wilson; slating, T. Cross & Sons; heating, Seward & Co.; electric lighting, Calvert & Heald—all of Lancaster.

Obituary.

Mr. James Salmond, civil engineer, of Dundee, died recently.

Mr. M. Marshall Milner, builder and contractor, of Lee Green, died recently.

Mr. James Pennington, builder, of Waterloo, Liverpool, died recently, aged 48.

Mr. Samuel Mather, surveyor to the Surbiton Urban District Council, died recently, aged 65 years. He was an associate member of the Institution of Civil Engineers and a member of the Sanitary Institute.

THE DRAINAGE OF LONDON.*

By Sir Alexander Binnie, C.E.,
Former Chief Engineer to L.C.C.

LONDON for the purpose of main drainage is divided by the River Thames into two entirely distinct portions, with distinct outfalls into the river: that on the north has its outfall at Barking, the system on the south having its outfall at Crossness.

Some idea of the difficulty of draining London may be gathered from the fact that out of the 121 square miles within the county at least 10 per cent., or 12 square miles, are situated below the level of high-water in the Thames, these districts being principally on the south side of the river.

Before 1855 the sewage of the Metropolis was discharged directly into the Thames by means of a series of sewers which ran practically at right angles to its course. This having caused the pollution of the river, the Metropolitan Board of Works instituted a series of intercepting sewers.

Sewers on the North.

On the north side of the river the high-level sewer, which acts by gravity throughout its own length, commences in the neighbourhood of Hampstead and Highgate, and passes to the outfall works at Barking. The middle-level sewer, taking its rise at Kensal Green and passing by way of Uxbridge Road and Oxford Street, is also a gravitation sewer from its commencement to the outfall at Barking. The low-level sewer which drains the lower districts north of the Thames commences at Hammersmith and is pumped about 16ft. at the western pumping station, where it is again pumped about 36ft. in the main outfall which passes to Barking.

The Isle of Dogs, the whole of which is below high-water mark, is served by a separate sewer, which also has a pumping station at Abbey Mills.

Sewers on the South.

On the other side of the river, in like manner, there are three intercepting sewers: one, the low-level, draining the district between Battersea, Bermondsey and Deptford, is pumped at the latter point and flows on to Crossness. The two sewers which drain the higher parts of South London receive the sewage pumped from the low-level at Deptford, but the combined sewage of the whole of South London is finally pumped at Crossness a height of 20ft.

The Outfall Works.

Up to 1888 the sewage was passed untreated into the river at the two outfalls, Barking and Crossness, but the pollution became so evident that the Metropolitan Board of Works, under the advice of my predecessor in office, the late Sir Joseph Bazalgette, commenced a series of precipitation works at the two outfalls. These works have been fully described by the late Mr. W. W. Santo Crimp and Mr. Edward Worth in a paper read before the Institution of Civil Engineers on February 23rd, 1897.

The principle adopted in these works is that of

Chemical Precipitation.

4 to 5 grains of lime and 1 grain of sulphate of iron per gallon being added to the crude sewage. It is then admitted into precipitation channels, from which the effluent water passes into the river. The sludge so deposited, after a further period of sedimentation, is pumped into ships and deposited in the sea twenty miles below the Nore.

These works as originally designed were estimated to deal with 150 million gallons of crude sewage a day and 3,000 tons of sludge per day. The total quantity of sewage now dealt with is about 132 million

gallons a day at Barking and 98 million gallons a day at Crossness, a total of over 230 million gallons. The quantity of sludge sent to sea is over two million tons per annum, containing a little less than 10 per cent. of solid matter. There are six ships of 1,800 tons gross and 1,000 tons nett capacity engaged in this work, and in the year 1900 their aggregate number of voyages totalled a distance of 236,000 miles. The capital cost of works of precipitation only, including ships, was £1,079,000, and the annual cost of working is about £161,000.

Wonderful Results.

The wonderful effect produced by the work of the past eleven years, as briefly described above, has been of a character which has surprised even those who were most sanguine at the time of the inauguration of the system. The river, which previous to 1890 was exceedingly foul in the neighbourhood of the outfalls, with large masses of black, floating matter, is now comparatively free from all noticeable pollution. In so speaking of the Thames it must be remembered that at the point of outfall it is a large navigable river of slightly brackish water, so that that refinement or purification which would be applicable in inland towns is not required.

During the past nine or ten years a series of experiments has been carried out on bacterial filtration, which has been fully described by Dr. Clowes, and about the efficacy of which there can be little doubt.

When we look at this important matter of the purification of the effluents of our sewage works we must all acknowledge that it is in a state of considerable uncertainty, as no one can confidently affirm that any one particular mode of treatment is the best or which can be applied under all circumstances. And this view is fully confirmed by the interim report of the Royal Commission on Sewage-disposal, which has recently been made public.

The Present Position of Affairs

may be said to be one of transition. Formerly it was considered that dead organic matter was almost, if not entirely, removed by the action of the oxygen in the air; in other words, that it was a process of burning up and of a more or less chemical character.

Within the last twenty years, however, principally owing to the valuable series of experiments carried out at Massachusetts, in the United States, we have been brought face to face with the fact that the elimination of dead effete matter is largely, if not entirely, due to the action of various microbe organisms. These organisms, acting for a longer or shorter period, appear to be able to reduce dead organic matter into an inert and harmless condition.

I have studied the question very carefully for the past eleven or twelve years, and the

Conclusions

at which I have arrived may be briefly summed up as follows:—

(1) That, as far as possible, all solid and floating matter should be removed from the sewage by mechanical means; for although undoubtedly these solid and suspended matters would ultimately be destroyed by the micro-organisms, yet the time required would be too long to admit of its application in ordinary cases.

(2) That, as far as possible, such minute suspended matter still remaining in the sewage should be reduced by the aid of those organisms with which we are well acquainted from the solid to the fluid state. This, to my mind, is the first step and the first lesson which we have clearly learned from our investigation into this wonderfully interesting subject.

The effluent sewage containing, then, a large proportion of dissolved organic matter, is in a condition to be further treated either by intermittent filtration in what are called

Contact Beds,

or by some other means being brought into contact with those organisms which have the mysterious power of reducing these dissolved organic substances, which if left to themselves would putrify and be the cause of offensive smells, if not of dangerous consequences.

In the case of intermittent filtration and contact beds considerable difficulty arises from the presence in the effluent, along with the dissolved organic matter, of certain mineral substances in a minute state of subdivision, derived, no doubt, from the washing of the streets. These latter substances, of course, cannot be acted upon by any species of bacteria, consequently, in course of time, they tend to clog up the filter beds themselves.

But intermittent filtration and contact beds is not the only mode of treating the sewage effluent which has been deprived of its grosser and more palpable organic matter. It is a well-known fact that if the sewage effluent be poured into a sufficiently large volume of otherwise comparatively pure water the dissolved organic matter contained in it disappears with remarkable rapidity; in other words, the contact bed, instead of being composed of coke or other solid matter, is formed of water in which the mysterious process of the reduction of the dissolved solids is carried on.

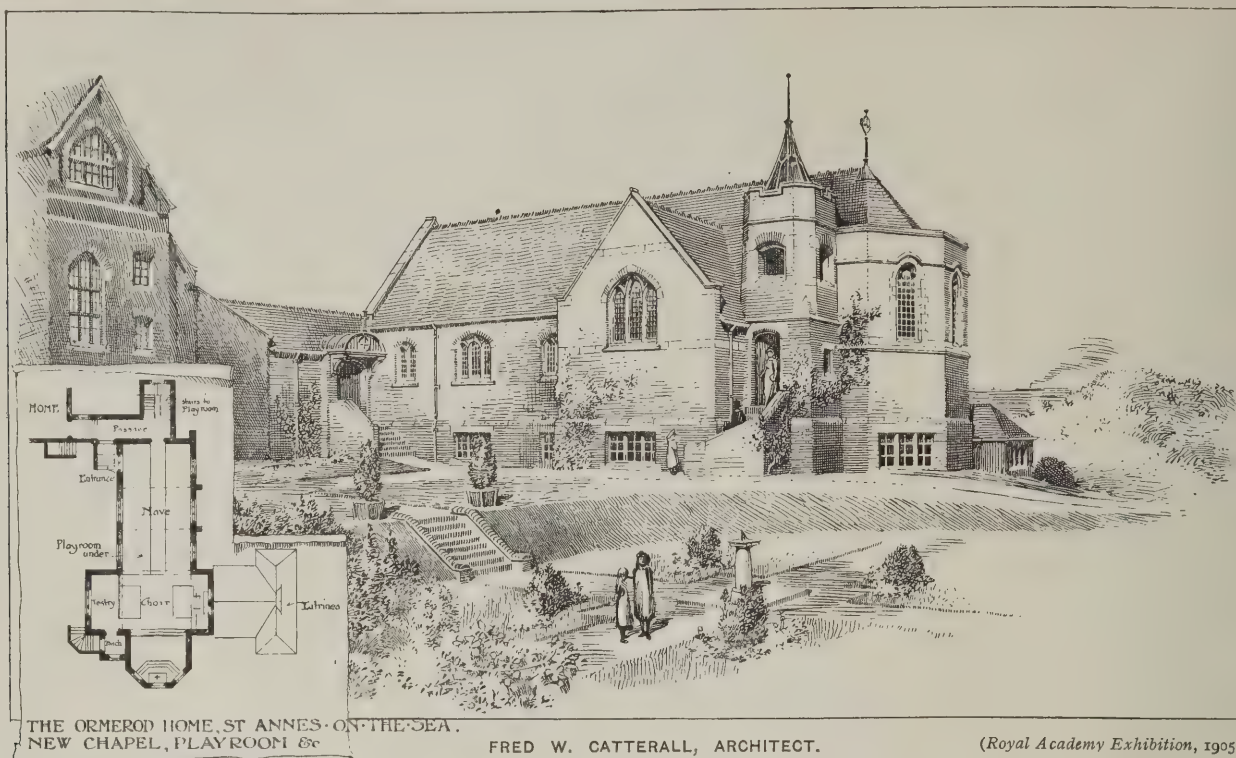
Of course, it is to be understood that the water into which the sewage effluent is discharged must be of large volume and in constant motion, and it is to this latter process that the success which has attended the London sewage works is to be attributed.

No doubt these works are not perfect, and at the present time require enlargement, but the success which has attended the work of the past eleven years is a sufficient guarantee that, if the surrounding circumstances are suitable, this mode of treatment is almost as good as any which at the present time can be suggested.

Law Cases.

Value of Premises in Piccadilly.—The case of the *Norwich Union Life Insurance Society v. the London County Council* came before Mr. Loveland Loveland, K.C., and a jury at the Clerkenwell Sessions House recently. This was a claim for compensation in respect of the compulsory sale to the Council of a strip of frontage, area 1,210 sq. ft., in St. James's Street and Piccadilly. The premises had a total area of 6,525 sq. ft., and 5,314 sq. ft. were thus left in the claimants' possession. Mr. James Green (Weatherall & Green) estimated the annual ground value of the property in question at £1 ts. 6d. per foot, and capitalized it at 30 years' purchase, adding 10 per cent. for compulsory sale and £10,000 for damage to the residue, his total being £52,949. In cross-examination Mr. Green said he did not know whether his figures worked out at one million and a half per acre. Mr. Runtz and Mr. Gruning gave evidence from an architectural point of view as to the user of the site. Mr. Leslie R. Vigers, member of the council of the Surveyors' Institution, expressed the opinion that the capital value of the site was £32 per foot, or £38,720. With 10 per cent. thereon for forced sale and an allowance in respect of damage to the remaining portion of the property, his total valuation amounted to just over £51,000. On behalf of the County Council Sir Edward Boyle called Mr. W. H. Warner (Lofts & Warner), who valued the land in question at 16s. a square foot, or £968, which he capitalized at 25 years' purchase—£24,200, amounting with 10 per cent. for forced sale to £26,620. Mr. G. H. Brougham Glasier, Mr. Howard Martin and Mr. William Woodward also gave evidence. The jury awarded the claimants the sum of £41,000.

* A paper read before the London Conference of the Sanitary Inspectors' Association on Thursday last, August 17th, 1905.



(Royal Academy Exhibition, 1905.)

THE TESTING OF NEW MATERIALS.

THE Bureau of Buildings of the Borough of Manhattan, New York, have gone into an investigation as to what specifications should govern the acceptance of new building materials. This was made necessary by the introduction of sand-lime bricks, cement bricks, hollow concrete blocks, &c. Common building bricks having been accepted as sufficiently strong, they were taken as the basis, and a series of tests were carried out by Prof. Woolson at Columbia University with a view to determining such factors as were necessary. As a result of these tests Prof. Woolson found that figures for transverse strength given in engineering books showed results from 20 to 50 per cent. too high. There was also no conformity between transverse and crushing strength and between strength and absorption. The crushing strength of the common American brick is about 4,000 lbs. per sq. in. When crushed wet, this figure is always lower by 10 to 45 per cent. For absorption tests Prof. Woolson recommends only partial immersion. He also recommends that the methods of testing bricks should be standardized, so that results may be comparable.

Following on these tests a number of regulations have been formulated and approved by the authorities of Manhattan. These stipulate that the material is to be subjected to the following tests: Transverse, compression, absorption, freezing, and fire; and additional tests may be called for when considered necessary. For the purpose of the tests at least fifteen samples or test pieces must be provided, such samples being approximately 8 ins. long., 4 ins. wide and 2 ins. thick. The transverse test is to be made first on full-sized samples, and the resulting half samples are then to be used for the compression and absorption tests.

Transverse Test.

For this test the sample will be placed flat on two rounded-knife-edge bearings set parallel, 7 ins. apart. A load will then be applied on top, midway between the supports, and transmitted through a similar rounded edge, until the sample is ruptured. The modulus of rupture will then be determined by multiplying the breaking load in lbs. by 21 (three times the distance between supports in inches) and dividing the result by twice the product of the width (approximately 4)

in inches by the square of the depth (approximately 2) in inches.

Compression Test.

For this test the sample must first be thoroughly dried to a constant weight, then carefully measured, then bedded flat in plaster-of-Paris or blotting paper, to secure a uniform bearing in the testing machine, and crushed. The total breaking load will then be divided by the area in compression in square inches.

Absorption Test.

For the absorption test the sample will first be thoroughly dried to a constant weight, the weight carefully recorded, and the sample then placed in a pan or tray of water, immersing it to a depth of not more than $\frac{1}{2}$ in. It will again be carefully weighed at 30 minutes, 4 hours and 48 hours respectively from the time of immersion, being placed in the water in each case as soon as the weight is taken. Its compressive strength, while still wet, will then be determined at the end of the 48 hours period.

Freezing Test.

For this test the sample will be immersed (as described) for at least 4 hours, and then weighed. It will then be placed in a freezing mixture or a refrigerator, or otherwise subjected to a temperature of less than 15 degs. Fahr. for at least 12 hours. It will then be removed and placed in water, where it must remain for at least one hour, the temperature being at least 150 degs. Fahr. This operation is to be repeated twenty times, after which the sample will again be weighed while still wet from last thawing. Its crushing strength will then be determined.

Fire Test.

For this test two samples are to be placed in a coal-gas furnace, in which the temperature will be gradually raised to 1,700 degs. Fahr. in one hour. One of the samples will then be plunged in cold water (about 50 degs. to 60 degs. Fahr.) and results noted; while the second sample will be permitted to cool gradually in air and the result noted.

Requirements to ensure Acceptance.

The following requirements must be met to secure an acceptance of the materials by the Manhattan authorities:—The modulus of rupture must average 450, and must not fall below 350 in any case. The ultimate compressive strength must average 3,000 lbs.

per sq. in., and must not fall below 2,500 in any case. The percentage of absorption, being the weight of water absorbed divided by the weight of the dry sample, must not average higher than 15 per cent., and must not exceed 20 per cent. in any case. The reduction of compressive strength must not be more than $33\frac{1}{3}$ per cent., except that when the lower figure is still above 3,000 lbs. per sq. in. the loss in strength may be neglected. The freezing and thawing process must not cause a loss in weight greater than 10 per cent., nor a loss in strength of more than $33\frac{1}{3}$ per cent., except that when the lower figure is still above 3,000 lbs. per sq. in. the loss in strength may be neglected. The fire test must not cause the material to disintegrate. (Note.—No great stress will be laid on this last test.)

Builders' Notes.

Reinforced Concrete in Austria.—Writing to the "Times" from Vienna, Mr. E. Probst says that the last few years have witnessed an enormous development in the use of reinforced concrete for structural purposes there, but very little competition exists because the industry is maintained in relatively a small number of hands. The floorings of many of the largest buildings, as, for instance, those for the new post-office and the new chamber of commerce at Vienna, are almost entirely of reinforced concrete, while the piers and floors of the most recently built warehouses are likewise constructed of armoured concrete.

Rugeley Church.—A new chancel, vestries and organ-chamber are being built at St. Augustine's, Rugeley, from the designs of Mr. F. L. Pearson at a cost of £5,000. Mr. Edwin Whittingham, of Newport, Salop, is the contractor.

The Calendar of the Glasgow and West of Scotland Technical College for the session 1905-06 has just been issued, and will be found to be replete with all information concerning the various subjects taught, fees, diplomas and scholarships. The calendar is published at 1s., and may be obtained from the Secretary and Director at the College in Glasgow.

Views and Reviews.

Municipal Engineers' Specification.

The first number of this annual text-book has just been published. It is a sister volume to "Specification," and deals especially with those aspects of construction in which Municipal Engineers are interested.

This first volume is divided into four divisions—I. Executive work (dealing with such subjects as Municipal cleansing, Municipal buildings, Municipal plant, Ambulances, &c.); II., Roads; III., Sewerage; and IV., Electricity supply. It is not possible in the compass of a review to consider the various articles and notes in detail, but in the first division we may notice the notes on "Dust-laying," by Mr. John Hatton, of Buxton, which will be of peculiar interest at the present time, owing to the difficulty in dealing with the dust problem, which the advent of motor cars has brought so prominently into notice. Mr. Hatton, after dealing generally with the recent steps taken by various public and private bodies to devise a remedy for the difficulty, deals in detail with all the various patented substances for laying dust, and gives particulars of the various experiments which have been made with each of them.

Another important article in the same division is that on disinfectants by Dr. David Sommerville, lecturer on Public Health at King's College. For very many years past, new disinfectants have been placed upon the market and actively boomed by their proprietors, which have had little or no value as germicides. At the Sanitary Institute Congress in 1903 Dr. Rideal and Mr. J. T. Ainslie Walker read a paper showing that in tests against certain bacteria cultures the majority of disinfectants were comparatively useless, or that the amount of them required to kill the typhoid bacillus was so great that in one case the cost of the disinfectant would amount to the incredible sum of £68.

An article by Mr. Sidney F. Walker on municipal motor wagons should be read with considerable interest. Mr. Walker's article deals very minutely with three different types of cartage wagons and the working of the machinery in each. An article by Mr. Arthur Ventris, Deputy Engineer of the City of Westminster, gives particulars of the working of the motor wagons in that city.

A section is devoted to the question of ambulances, a subject which is at present receiving the attention of the London County Council; and the notes prepared by Mr. W. R. Edwards, of the St. John Ambulance Association, on the various classes of ambulances and the details of the ambulance service in London, Manchester, Liverpool, Paris, Vienna, New Orleans and other places should be of considerable value.

In connection with the question of roads the articles on tar macadam are among the most important. A good deal of information in the book is given in tabular form, showing the cost and details of roadmaking and the various kinds of road materials used in different towns. In connection with tar macadam the methods of manufacture of this road material and the making of roads are given for fourteen towns. Though this material has long been used for the construction of footways in suburban and country districts it is only recently that it has been employed in the making of roads. The short trial lengths which have been laid on the Victoria Embankment will be watched with some interest.

Another question in connection with our city streets is the continual breaking-up of the surface to attend to the various mains and services. The only remedy for this appears to be the construction of subways, and it is worth noting that the London County Council in all the new streets it is

constructing is putting in these subways. A special article on the subject by Mr. R. M. Parkinson is given on p. 171, and designs for several different types of subways are illustrated and estimates given for the construction of the same.

Another subject that is dealt with at considerable length is the question of sewage treatment. In connection with this subject we reprint part of the editorial summary and conclusions on the published reports of the Royal Commission on Sewage disposal, and the notes on this question are practically an abridgment of the evidence given by the various experts before that Commission, supplemented by constructional notes to show the design of the various beds and filters:—

The elimination, naturally, of the foul matters in sewage is accomplished by the action of micro-organisms and their products; certain organisms eliminating the suspended solid matters in the absence of air, preparing the sewage for other organisms who eliminate the dissolved organic matters in the presence of abundant air. These processes are complicated by the existence of another large class of organisms, distinct from the other two, which is capable of working in the absence or presence of air according to the material presented to it to work upon. The waste products of the organisms also assist in the work of "breaking down" the polluting matters.

These micro-organisms are housed naturally in the soil within a few feet of the surface, and consequently the land has been utilized for the purification of sewage for a very considerable period. As far as can be ascertained, the various classes of micro-organisms are promiscuously mixed in the soil, and the two operations in the purification of the sewage may proceed side by side, but because of this the rate of purification is slow. It is believed that the organisms that require air predominate at the surface of the soil or nearest the air, and the others, working in the absence of air, deeper down; but as those deep down are required for the first stage of purification (the elimination of the suspended solids) and those on the surface are required for the second stage (the elimination of the dissolved organic matter), this may explain the slowness of purification by the soil. Moreover, long experience of purification by the soil has shown that if crude sewage is turned on to the soil it gradually clogs the surface with the suspended solids, possibly because the first-stage bacteria are not present there in sufficient numbers to deal with it.

Experience in land treatment has also proved that certain soils, those of the lighter kind having most interstitial space, are better for purification purposes than those of a heavy, close kind, having little or no interstitial space; and although no soil is, scientifically, useless for purification purposes, some soils are useless for the practical work of purifying a town's sewage, as they introduce requirements of time, area (and consequently cost), with which it is impossible to comply. Even where the soil is practically suitable for purification, the difficulty of the surface-clogging still exists, and this can only be obviated by relieving the soil of the initial work of purification, viz., the elimination of the suspended solids. This is accomplished by first screening the crude sewage, which is afterwards allowed to rest for a short period in tanks, during which a large portion of the solids mechanically subside, and the clarified effluent passes on to the land or to a filter, where the dissolved organic matter is dealt with by micro-organisms working in the presence of air. The same effect may be produced, but rather more speedily, by the addition of chemicals to the crude sewage, but in this case care

must be exercised that the quantity or properties of the chemicals added are not such as to inhibit or retard the subsequent necessary bacterial action to eliminate the dissolved organic matter. Both these methods, however, leave a residuum of mineral or organic solids termed sludge, and this is troublesome and costly to get rid of. It was at one time thought to possess great manurial value; but it is now known that the most valuable manurial properties in sewage only come into existence during the second stage of treatment. The difficulties with the land in practical purification led to the devising of artificial substitutes for the soil as a housing medium for the micro-organisms.

It has been found that, by the adoption of artificial beds and the separation as far as possible of the operation of the bacteria that do not work in the air, or anaerobes, and those that do require air, or aerobes, the process of purification can be accomplished more speedily than by treatment on the land, and the purification effected is as good or better. The elimination of the suspended solid matters are effected (if the chemical precipitation or simple subsidence methods are not adopted) by treatment in a septic tank, where the crude sewage is held up for a sufficient time to enable the anaerobes to change and liquefy the solid organic matters into ammonia; there is, in addition, some carbon matter present. As air is detrimental to anaerobic action the first septic tanks were covered in; but it has since been found unnecessary (as far as the purification is concerned), and the tanks are now mostly made open. The surface of the sewage in these becomes covered in a few weeks to two or three months after the first filling with a scum some inches thick which acts as an air excluder, and is due to the septicizing or putrefying action going on in the tank. The anaerobic action must, however, not be allowed to go too far or it will inhibit the subsequent bacterial action. The action in the septic tank is mainly that phase of fermentation called putrefaction, and offensive gases and smells are given off. On this account the use of this tank has been opposed in many quarters, and this opposition has led to attempts to carry out the whole of the purification by aerobic means, discarding the anaerobic action. The aerobic system is known as the "contact bed" system, and it may be either a "double contact" or a "multiple contact." In the first-named the crude sewage is first held up in contact on a bed of coarse material (as coke, &c.) and afterwards similarly rested in a bed of finer material; similarly in the "multiple contact" there are three or more beds from coarse to fine. The sewage is admitted at the bottom of the bed and rises until it reaches the top of the bedding material; the filling, it is held, must be done quickly. The bacterial action in these beds was presumed to be wholly aerobic.

That the action is wholly aerobic is open to grave doubt if crude sewage is being treated on contact beds. The natural action in the first stage of purification is anaerobic, and it is almost certain that this action persists in spite of the aerobic conditions aimed at in the bed. For the treatment of crude sewage the contact bed has been a failure. Even with the most careful management it shows a gradual loss in capacity by silting-up, and the surface is easily clogged; it is further slow in action.

Contact beds have, however, answered very well when used for the second operation of eliminating the dissolved organic matter. They constitute one class of filter in the final treatment; flow filters are the other.

The last division, devoted to Electricity Supply, is in charge of Mr. E. Kilburn Scott.

The Municipal Engineers' Specification, No. 1, 1905. 2s. 6d. nett. London: 6, Great New Street, E.C.

ENGLISH AND FRENCH GOTHIC.
A Breezy Criticism.

PROFESSOR BALDWIN BROWN, of Edinburgh, having come to the rescue of English Gothic in a recent number of the "North American Review," esteeming it to have been much too despitely treated by Mr. Charles H. Moore in his "Gothic Architecture," we find the "Architectural Record" of New York engaged in a breezy criticism of the Professor. Our contemporary observes: "It is true, of course, that, as Professor Baldwin puts it, 'English Gothic is so remarkable an artistic achievement that at one time to the insular imagination it represented the style in general, as if Gothic were an English institution in which other countries only shared.' Daniel Webster was at one time misled into making an address on the subject in which he waxed exceeding bold and said that Gothic architecture might properly be called English architecture, seeing that its principal monuments were in England. But that proves nothing but that the godlike Daniel did not know much about architecture. Poor Mr. Fergusson talked in much the same way, instituting elaborate and absurd parallels between Lichfield and Cologne, for example, to prove the superiority of the insular variety. But one thought it now recognized by serious students that the insular imagination would have been impossible, if it had been supplied with more information.

English Gothic not Belated French.

"Professor Baldwin has a good deal to say, and it is all instructive and worth saying, about the differences between the English cathedral as the nucleus or the result of a monastic establishment and the French cathedral as a church of the people. The very fact that the foreground and frame of the former are a 'close' and of the latter a 'place' is significant of many differences. Ruskin's vivid description of the typical English cathedral in the 'Stones of Venice' would have presented an even more vivid

contrast with a French cathedral than with St. Mark's, with which he contrasted it. But all that has nothing to do with the specific point Professor Baldwin tries to make, which is that English Gothic is not a belated copy of French, but a parallel and independent artistic development. To that effect he quotes a recent German historian that, 'regarded as a whole, Early English is an essentially autonomous (autochthonous?) style,' and that 'what it owes to French Gothic is only the first impulse.'

"Evidently this kind of discourse is equally aimless and endless until you have defined your terms.

What do you mean by 'Gothic'?

That is the first question. Professor Moore tells us exactly what he means by it. He means 'a system of construction in which vaulting on an independent system of ribs is sustained by piers and buttresses whose equilibrium is maintained by the opposing action of thrust and counterthrust.' If one accepts that definition, it will be difficult, if not impossible, for him to resist Mr. Moore's conclusion that there is no Gothic, properly so-called, outside of France, except what has been directly inspired by French examples. Does Professor Baldwin accept it? Apparently not, for he says, *inter alia*, 'we cannot reasonably condemn English work for falling short of the French ideal if it was all the time inspired by a distinct ideal of its own.' Very well. What was the ideal 'which was a rival to that of the French Gothic? If it was 'distinct,' it must be susceptible of distinct expression. But for such an expression, such a definition, we search Professor Baldwin's pages quite in vain.

"The German expression of

'Tectonics,'

which he adopts, and which denotes the devices by which a definite and organic structural scheme is carried into execution, he does not appear to think meets the whole case. Certainly, if it does, his case for the originality or the perfection of English Gothic is gone. Students who admire

Gothic as 'a system arising out of a principle,' to quote Mr. Eidlitz's: 'Nature and Function of Art,' will have no difficulty in agreeing with Professor Moore's conclusions about it. Such students would unhesitatingly select the choirs of Canterbury and Westminster as

The most Gothic things in England,

undeterred by the evident and admitted fact that they are the least English, and were in fact the work of Frenchmen imported to do them. The residue of English cathedral architecture they would dismiss as a picturesque degeneration of French Gothic in which the forms were retained but the reason for the forms had been forgotten.

To maintain that English Gothic is as Gothic as French Gothic, one must overthrow the definition of Gothic and produce a new one which English work fulfils as well or better than French. It does not meet the case to assert that the English, 'with their national genius for compromise, are satisfied in art with an attractive general impression and hesitate to apply the severer aesthetic canons.' On the contrary, it gives the case away. Neither is it to the point to say that the English parish churches are extremely picturesque and pretty, as they undoubtedly are. We have just called English Gothic a picturesque degeneration of French, although the most insular form of the style, the Perpendicular, which Professor Freeman, apparently on that account, finds 'on the whole the best,' is as far from being the most picturesque as it is from being the most Gothic. And so much that is adventitious enters into the picturesqueness of the English parish church that one cannot credit the architect with more than a share in it. He might as well ascribe to the mediæval English builder the romantic associations which form so much of the charm of his work, or the 'ivy mantle' which cloaks his tower, or even the moping owl which complains from it to the moon. The ivy mantle and the moping owl are not architecture."

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:				
Aug.	24	Durham—Houses	Durham Co-operative Society ...	G. Ord, Architect, 16 The Avenue, Durham.
"	24	London, N.—Hospital Block	Hornsey Town Council ...	E. J. Lovegrove, Municipal Offices, 99 Southwood Lane, Highgate.
"	24	Kedington, Suffolk—Additions to Workhouse	Guardians	J. Bigmore, Clerk, 24 Queen Street, Haverhill, Suffolk.
"	24	Kendal—House	J. Wiper	W. Levens, Highfield, Kendal.
"	24	Preston—Alterations... ..	Guardians	J. Gandy, Architect, St. Helens.
"	24	Preston—Scullyery	Guardians	—Whitwell, Clerk of Works, Fulwood Workhouse.
"	24	Rhymney—Villas	L. Fine	J. L. Smith & Davies, Architects, 67 High Street, Merthyr Tydfil.
"	25	Bradford—Works	Education Committee ...	Education Office, Manor Row, Bradford.
"	25	Cricklewood—Sorting Office	H. M. Office of Works ...	J. Wager, H.M. Office of Works, Storey's Gate, S.W.
"	26	Bosfrankan—Piggery	H. H. Laity	H. H. Laity, Bosfrankan, St. Buryan, Cornwall.
"	26	Cardiff—Foundations	University College Council ...	W. D. Caroe, Architect, 8a Whitehall Place, London, S.W.
"	26	South Shields—Car-sheds	Town Council	S. E. Burgess, Borough Engineer, South Shields.
"	26	Macclesfield—School	Education Committee ...	J. F. May, 43 Church Side, Macclesfield.
"	26	Heysham—Council Offices, &c.	Urban District Council ...	H. Miller, Surveyor, Council Offices, Heysham.
"	26	Queensbury and Otley—Works	Education Committee ...	County Hall, Wakefield.
"	28	Tadley and Hambledon—School Additions	County Council	W. J. Taylor, County Surveyor, Winchester.
"	29	London—Admiralty Extension	H. M. Office of Works ...	Sir Aston Webb, 19 Queen Anne's Gate, S.W.
"	29	Chelsea—Staircase	Guardians	Guardians' Offices, 250 King's Road, Chelsea, S.W.
"	31	Batley—Fittings to Stores	Batley Co-operative Society ...	H. B. Buckley, Architect, 85 Commercial Street, Batley.
"	31	Bridgend—Library	Free Library Committee ...	P. J. Thomas, Architect, Station Road, Bridgend.
"	31	New Romney, Kent—Re-slatng Roof of Town Hall	Town Council	Borough Surveyor, New Romney.
"	31	Wolverton—Schools	Education Committee ...	Clerk of Works Education Offices, Aylesbury.
Sept.	1	London, N.—School	Finchley U.D.C.	W. G. Wilson, Architect, 5 Bloomsbury Mansions, Hart Street, W.C.
"	2	Burnopfield—School	—	A. W. Kyle, Architect Burnopfield, R.S.O.
"	2	Taibach—Council Offices	Urban District Council ...	J. Cox, Surveyor, Port Talbot, Wales.
"	4	St. Bride's—Improvements to Mansion House	Lord Kensington	J. Fergusson, St. Bride's, Littlehaven, South Wales.
"	4	Aberdare—Classrooms	Education Committee ...	J. Morris, Town Hall, Aberdare.
"	4	Sawbridgeworth—Fire-station	Urban District Council ...	Council Offices, Sawbridgeworth.
"	5	Lye—Goods Shed	Great Western Railway Company ...	Engineer, G.W.R. Station, Wolverhampton.
"	5	Blackburn—Post Office	H. M. Office of Works ...	Postmaster, Blackburn.
"	6	Clutton—Alterations at Workhouse	Guardians	W. F. Bird, Architect, Midsomer Norton.
"	7	Croydon—School	Education Committee ...	J. Smyth, Clerk, Education Offices, Croydon.
"	8	Barry, Glamorgan—Coastguard Buildings	Admiralty	Civil Engineer, H.M. Dockyard, Pembroke Dock.
"	11	Sydney—School	Education Committee ...	M. H. Medland, Architect, 15 Clarence Street, Gloucester.
"	11	Ipswich—School	Education Committee ...	E. T. Johns, Thoroughfare, Ipswich.
"	16	Wallasey—Schools	Urban District Council ...	J. Holt, Architect, 9 Albert Square, Manchester.
"	20	Aylesbury—Schools	Education Committee ...	Clerks of Works Department, Education Office, Aylesbury.
"	23	Barnet—Church House	Trustees	E. Dolton, 35 Wood Street, Barnet.
"	26	Somersham, Ipswich—School Enlargement	Education Committee ...	G. W. Leighton, Princes Street, Ipswich.
"	26	Henley, Ipswich—House	Education Committee ...	G. W. Leighton, Architect, Princes Street, Ipswich.
"	26	London—Blocks of Buildings	County Council	Superintending Architect's Department, 15 Pall Mall East, S.W.
Oct.	16	Preston—School	Education Committee ...	Education Offices, Preston.

Complete List of Contracts Open.—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ENGINEERING:			
Aug. 24	Rome—Dredging	S. Staffordshire Waterworks Co.	Public Works Department, Rome.
" 24	Shavers' End, Dudley—Reservoir		H. Ashton Hill, Engineer, Paradise Street, Birmingham.
" 25	Valletta, Malta—Refuse-destroyer		Crown Agents for the Colonies, Whitehall Gardens, London.
" 28	Selby—Pumping Machinery	Urban District Council	P. Griffiths, M.I.C.E., 54 Parliament Street, Westminster, S.W.
" 28	Witham—Steam Roller	Urban District Council	W. P. Perkins, Surveyor, Witham.
" 29	Belgrade—Bridge		Minister for Buildings, Belgrade.
" 30	Port Talbot—Coaches	Port Talbot Rlwy. & Docks Co.	E. Knott, Secretary, Port Talbot.
" 30	Motherwell—Boilers	Middle Ward Hospital	J. Dixon, 219 St. Vincent Street, Glasgow.
" 31	Peterborough—Pumping Station	Town Council	J. C. Gill, Waterworks Engineer's Office, Peterborough.
Sept. 1	Merthyr Tydfil—Destructor Plant	Urban District Council	T. F. Harvey, Town Hall, Merthyr.
" 1	Wolverhampton—Pumping Engine	Corporation	E. A. B. Woodward, Town Hall, Wolverhampton.
" 1	Morley—Main-laving	Waterworks Committee	W. E. Putnam, Borough Engineer, Morley.
" 4	Sunderland—Bridge Widening	Corporation	Borough Engineer, Town Hall, Sunderland.
" 4	Southampton—Pumping Engines	Corporation	Borough Engineer, Market Chambers, 123 High St., Southampton.
" 4	Scarborough—Bridge	North-Eastern Railway Co.	W. J. Cudworth, Engineer, York.
" 4	London, S.E.—Alterations to Engineering Arrangements... ..	Metropolitan Asylums Board	Metropolitan Asylums Board Offices, Embankment, London, E.C.
" 5	Neath—Reconstruction of Bridge	Great Western Railway Co.	Engineer, Paddington Station.
" 11	Sculcoates—Swing Bridge... ..	North-Eastern Railway Co.	W. J. Cudworth, Engineer, York.
" 11	Bristol—Pumping Machinery	Docks Committee	W. W. Squire, Cumberland Road, Bristol.
" 12	Bishop's Stortford—Pumping Engine	Urban District Council	T. Swatheridge, Council Offices, 7 North Street, Bishop's Stortford.
" 15	Alicante, Spain—Harbour Works	Harbour Board	Harbour Board, Alicante.
" 15	Portsmouth—Machinery	Education Committee	A. H. Bone, Cambridge Junction, Portsmouth.
" 20	Immingham—Dock	Directors	Sir J. Wolfe Barry & Partner, 21 Delahay Street, Westminster, S.W.
" 25	Sewree, Bombay—Pier	Bombay Port Trustees	Sir J. Wolfe Barry, 7 The Sanctuary, Westminster, S.W.
" 28	Zulcea, Roumania—Water-supply	Municipality	Municipal Offices, Zulcea.
Oct. 10	Alexandria, Egypt—Quays		Director-General of Harbours and Lighthouses, Alexandria.
IRON AND STEEL:			
Aug. 25	Valletta, Malta—Wrought-iron Casements	Waterworks Committee	Crown Agent for the Colonies, London.
Sept. 1	Morley—Pipes	Municipal Board	W. E. Putnam, Borough Engineer, Morley.
Oct. 9	Mussoorie, India—Pipes, &c.		C. H. Shanahan, Municipal Office, Mussoorie.
PAINTING AND PLUMBING:			
Aug. 24	Manchester—Painting Wharf	Markets Committee	City Architect, Town Hall, Manchester.
" 24	Mickleover—Painting Asylum Wards	Derby County Asylum	Mr. McWilliams, Engineer, Derby County Asylum, Mickleover.
" 25	Buckingham—Interior Renovation of School... ..		G. Bennett & Son, Buckingham.
" 26	Coventry—Painting Police-station	Watch Committee... ..	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry.
" 28	Gateshead—Cleaning and Painting at Schools	Education Committee	E. J. Harding, Education Offices, Gateshead.
" 30	Edmonton—Painting	Urban District Council	H. W. Dobb, Town Hall, Lower Edmonton.
" 30	Skewen—Painting Chapel		J. Cook Rees, Architect, Neath.
Sept. 1	Grimsby—Painting Forty-eight Almshouses		S. Ellis & Sons, Victoria Street, Grimsby.
ROADS AND CARTAGE:			
Aug. 24	London, N.—Road Works... ..	Hornsey Town Council	E. J. Lovegrove, Borough Surveyor, 99 Southwood Lane, Highgate.
" 24	Highgate, N.—Road Construction	Corporation... ..	E. Millard & Finsbury Circus, E.C.
" 25	Harrogate—Street-Improvement Works	Urban District Council	F. Bagshaw, Borough Engineer, Harrogate.
" 25	Oakworth—Road-making, &c.	Highways and Drainage Com- mittee.	Jackson & Priestman, Exchange Buildings, Bradford.
" 26	Oswaldtwistle—Materials		Chairman, Highway and Drainage Committee, Oswaldtwistle.
" 26	Ellesmere Port—Street-making	Urban District Council	J. M. Hudson, Surveyor, Ellesmere Port.
" 28	Narberth—Paving, &c.	Urban District Council	Clerk to the Council, High Street, Narberth.
" 28	Grange-over-Sands—Improvement Works	Urban District Council	T. Huddleston, Surveyor, Council Offices, Grange-over-Sands.
" 29	Carshalton—Footpath Works	Urban District Council	W. W. Gale, District Council Offices, Carshalton.
" 30	Sutton—Street Works	Urban District Council	G. Chambers Smith, Surveyor, Sutton, Surrey.
" 30	Enfield—Making-up	Urban District Council	S. W. Scott, Clerk, Public Offices, Enfield.
" 31	Walton-on-Thames—Granite	Urban District Council	R. Wilds, Surveyor, Council Offices, Walton-on-Thames.
Sept. 4	Steyning—Paving and Kerbing	Rural District Council	F. Slaughter, Surveyor, High Street, Steyning.
" 4	Southampton—Stone	Corporation... ..	J. A. A. Crowther, Borough Engineer, Southampton.
SANITARY:			
Aug. 24	Barnton—Sewerage Works	Rural District Council	W. M. Beckett, Engineer, 33 Brazenose Street, Manchester.
" 26	Ely—Sewerage Works	Urban District Council	Surveyor's Office, Waterside, Ely.
Sept. 1	Sedgefield—Sewerage Works	Rural District Council	D. Balfour & Son, 3 St. Nicholas Buildings, Newcastle-on-Tyne.
" 4	West Roddymoor—Drainage Works	Urban District Council	Surveyor's Office, Council Offices, Crook.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Aug. 26	Macclesfield—Schools	£10 10s.	—	J. F. May, 43 Churchside, Macclesfield.
Sept. 1	Elgin—Cemetery Extension	—	£1 1s.	Stewart & M'Isaac Solicitors, Elgin.
" 23	Cheshunt—Library	£50, £30 and £20	—	A. Collingwood Lee, Manor House, Cheshunt.
No date	Dartmouth—Town Hall	—	—	A. Smith, Borough Engineer, Victoria Chambers, Dartmouth.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

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ARCHITECT and SURVEYOR'S experienced and capable all-round ASSISTANT desires permanency. Thoroughly well versed in quantities, working drawings, construction, steelwork, details, surveying and levelling. Moderate salary.—H., Preston Villa, Markenfield Road, Guildford. 1238

ARCHITECT and SURVEYOR'S ASSISTANT desires ENGAGEMENT, 3½ years' varied experience, able to prepare working drawings from rough sketches; surveying, levelling, &c.; moderate salary.—X., 48, Thornton Avenue, Chiswick, W. 1240

ARCHITECT and SURVEYOR'S ASSISTANT, A.R.San.I., desires ENGAGEMENT; 10 years' varied experience. Measuring up, contract drawings, details, specifications, knowledge of quantities, surveying and levelling, superintending works.—Box 1278, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S Junior ASSISTANT (22½) desires SITUATION. Excellent draughtsman, well up in construction, working drawings, measuring and plotting, specifications. Could assist with quantities. Six years' experience.—S. W. H., Brookdale, Manor Road, Teddington. 1268

ARCHITECT'S ASSISTANT (23), six years' Midland experience, chiefly domestic; surveys, working drawings, details, &c.; low salary.—Z., "Ingleside," Olton, Birmingham. 1253

ARCHITECT'S ASSISTANT, 21 years' general and public experience; competent quantity surveyor. First-class references. Salary, 3 guineas.—Box 1261, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT'S ASSISTANT (25), experienced; free after 16th September. Domestic and all work. Salary 35s.—J. SUGDEN, "Beeches," Frimley Road, Camberley. 1297

ARCHITECT and SURVEYOR'S ASSISTANT, 10 years' good all-round experience, desires re-engagement, temporary or permanent.—For reference, &c., write, X. Y. Z., 104, Derby Road, Loughborough Leicester. 1300

ARCHITECT'S ASSISTANT; 4 years' experience; working drawings, details, general work, assist with quantities, good tracer, colourist. Good references. Salary, 25s.—Box 1299, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT'S IMPROVER (20) desires Engagement. Working drawings, small details, good draughtsman, &c. Small salary.—R. R. H., 6, Cromwell Road, King's Lynn. 1294

BUILDER'S, &c. CLERK OF WORKS ASSISTANT (22); drawing, tracing, knowledge quantities and details; 4½ years in architect's office; certificates, building construction, advanced, 1st freehand, &c.—H. M. N., Thornicroft, Farnham, Surrey. 1243

BUILDER'S WORKING FOREMAN seeks permanency in private or jobbing firm in London district. Well up in all branches, plans, and details. Trade, bricklayer. Good references. Abstainer. Aged 30.—Wood, 80, Selwyn Avenue, Higham's Park, N.E. 1269

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MACHINIST (Joiners), spindle, tenon, general joiner, moulding, machines, &c.; all-round hand; take charge and set out if required; good references and reliable.—JOINER, 65, Fairfield Road, Bow, E. 1265

MACHINIST (24), spindle hand improver; can also work saw bench, band saw, overhead and panel planer; make cutters, sharpen saws.—MACHINIST, 18, Lausanne Road, Peckham, S.E. 1266

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PLUMBER (R.P.).—Gas and Hot Water Fitter, first-class all-round hand, wants work day or piece.—C., 4, Blake Terrace, Lynton Road, Gravesend. 1307

SURVEYING ASSISTANT, 12½ years' experience; competent to develop estates, surveying, levelling, and architectural work; specifications and quantities.—Box 1310, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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INCORPORATED 1893.

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See p. xx for the Employment Register

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Conditions of competition and Plans of site will be sent on application to the Director of Education, Education Offices, Preston.

Designs and Plans must be sent to me at the Town Hall, not later than 10 a.m., on MONDAY, the 16th of OCTOBER, 1905.

By order, HENRY HAMER,
Town Hall Preston, Town Clerk.
16th August, 1905.

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The Title Pages and Index to any volume of "THE BUILDERS' JOURNAL" may be had free, upon application being made to the Office, Great New Street, enclosing 1d. stamp to cover postage of same.

To Contributors.

THE EDITOR will be pleased to consider any articles, illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

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2. The charge of one penny will be made for each additional word.

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3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

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2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

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We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.

OFFICE: 6, GREAT NEW STREET, FETTER LANE E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barnes.—In the list of tenders for a cemetery chapel and lodge at Barnes, given on p. xiii of our issue for last week (Mr. Reginald B. Rowell, A.R.I.B.A., East Sheen, architect), the following was omitted:—

A. Hudson & Co., Westminster ... £2,580

Brecon.—For alterations, additions, &c., at Ffrwdgrech, for Mr. D. Evans. Mr. B. L. Pritchard, architect, 22, Castle Street, Brecon:—

B. Jenkins ... £2,460 0 0

N. Bagley ... 2,455 0 0

R. L. Williams,* Brecon ... 2,397 10 0

* Accepted.

Brookwood.—For the erection of a new Council school, for the Surrey Education Committee. Messrs. Jarvis & Richards, architects, 36, Victoria Street, Westminster:—

Enness Brothers, Erith, Kent ... £5,295 0 0

F. G. Minter, Putney ... 5,242 0 0

Sycamore Works Ltd., Wimbledon ... 5,138 0 0

W. Beauchamp, Englefield Green ... 4,991 12 7

Hudson & Co., London, S.W. ... 4,960 0 0

East & Hyde, Binfield, Berks ... 4,772 0 0

J. Faggetter, Pirbright ... 4,758 0 0

W. J. Renshaw, Putney ... 4,740 0 0

Cropley & Son, Leatherhead ... 4,739 0 0

W. Watson, Ascot, Berks ... 4,736 2 4

Oak Building Co., Cambridge ... 4,697 6 2

W. H. Hyde, Norwood Junction ... 4,658 0 0

Martin, Wells & Co., Aldershot ... 4,625 0 0

E. C. Hughes, Wokingham ... 4,624 9 8

J. J. Shopland, Sutton, Surrey ... 4,618 0 0

Tribe & Robinson, Guildford ... 4,595 0 0

R. Elvy, Southend-on-Sea ... 4,441 0 0

Fryer & Co., Paddington, W. ... 4,436 11 10

Moss & Co., Southend-on-Sea ... 4,326 17 7

Drowley & Co., Woking ... 4,319 18 4

W. W. Gale, Woking ... 4,269 10 2

G. Kemp, Aldershot ... 4,157 0 0

T. J. Hawkins,* R.F.A. Barracks, Whitehill, Hants ... 3,932 9 8

* Accepted.

Cardiff.—For the construction and maintenance during twelve months after completion of the following works in connection with the western district main outfall sewer, for the Corporation. Mr. W. Harpur, M.I.C.E., borough engineer:—(Contract No. 4) about 1,800 lineal yards of 4ft. gins. diameter circular sewer, wholly in tunnel, together with steel pipe arch, 200ft. span, over the River Ely, 30ins. diameter cast-iron rising mains, gauge chamber, bell-mouthed junctions and manholes; (5) about 2,940

lineal yards of 4ft. gins. diameter circular sewer, partly in tunnel, and manholes; (6) about 1,030 lineal yards of 4ft. gins. diameter sewer, 1,905 lineal yards, 13ft. diameter reservoir sewer, partly in tunnel, and 542 lineal yards 36in. diameter cast-iron outfall culvert, together with embankment and bridge across Sully Brook, penstock chamber, and manholes:—

Contract No. 4.

J. Dickson, St. Albans ... £50,727 10 5

W. Williams, Cardiff ... 46,997 0 0

Whyte & Co., Belfast ... 43,561 10 9

J. Jackson, Plaistow, E. ... 39,993 17 6

J. Strachan, Cardiff ... 39,644 14 7

G. Lawson, Glasgow ... 38,851 4 5

T. Taylor, Pontypridd ... 38,331 11 1

J. H. Macdonald, Oxford ... 36,729 0 0

Barnes, Chaplin & Co., Cardiff ... 36,317 19 2

G. Pollard & Co., Taunton ... 36,136 10 5

Muirhead, Greig & Matthews, London ... 35,182 1 3

S. W. Harrison & Co., Birmingham ... 44,258 13 0

L. P. Nott, Bristol ... 32,972 4 1

W. Jones & Son, Neath ... 32,893 13 2

R. H. B. Neal, Ltd., Plymouth ... 32,810 15 6

J. & T. Binns, Croydon ... 32,716 3 10

W. Underwood & Brother, Dukinfield ... 32,491 13 3

Hay, Lawton & Co., Westminster, S.W. ... 31,656 1 8

J. Best, Edinburgh ... 30,453 0 8

G. Rutter, Barry ... 27,803 0 0

Kellett's Ltd., London ... 26,501 11 11

S. Wood, Keynsham, near Bristol ... 23,693 8 0

Bentley & Loch,* Leicester ... 23,527 8 3

Contract No. 5.

W. Williams ... £49,259 0 0

J. Dickson ... 38,366 16 0

Whyte & Co. ... 37,960 6 0

J. Jackson ... 37,632 18 0

J. Strachan ... 37,192 0 0

T. Taylor ... 36,606 15 6

R. H. B. Neal, Ltd. ... 34,802 10 0

G. Lawson ... 33,297 10 0

Hay, Lawton & Co. ... 32,943 18 4

S. W. Harrison & Co. ... 32,804 0 0

G. Pollard & Co. ... 31,394 0 0

W. Jones & Son ... 30,799 0 0

J. & T. Binns ... 29,667 6 0

Barnes, Chaplin & Co. ... 28,691 2 0

W. Underwood & Brother ... 28,612 16 8

J. Best ... 28,011 15 0

L. P. Nott ... 27,063 13 0

Muirhead, Greig & Matthews ... 24,659 0 0

S. Wood ... 24,165 0 0

Kellett's Ltd. ... 24,102 10 0

G. Rutter ... 23,107 0 0

J. H. Macdonald ... 21,475 0 0

Bentley & Loch* ... 18,677 12 0

Contract No. 6.

J. Dickson ... £144,790 7 3

W. Williams ... 131,096 0 0

T. Taylor ... 129,644 17 2

G. Lawson ... £108,734 10 0

J. Riley, Cheltenham ... 106,017 3 8

J. Jackson ... 104,788 15 4

J. H. Macdonald ... 102,628 0 0

W. Underwood & Brother ... 96,489 19 4

S. W. Harrison & Co. ... 92,251 0 0

W. Jones & Son ... 89,891 6 10

J. & T. Binns ... 89,663 11 6

Hay, Lawton & Co. ... 89,482 9 2

Whyte & Co. ... 87,945 2 4

Barnes, Chaplin & Co. ... 87,113 6 5

J. Strachan ... 85,362 8 2

L. P. Nott ... 79,395 19 6

G. Pollard & Co. ... 79,189 4 6

Kellett's Ltd. ... 77,664 1 0

R. H. B. Neal, Ltd. ... 77,133 7 4

J. Best ... 72,149 12 10

Bentley & Loch ... 68,909 11 5

Muirhead, Greig & Matthews ... 67,110 4 6

G. Rutter* ... 57,947 0 0

* Accepted.

Everecreech (Somerset).—For the erection of four cottages at Southwood, with water-supply, drains, paths, &c., complete. Mr. Arthur J. Pictor, A.R.I.B.A., architect, Bruton, Somerset:—

W. Clarke & Son, Bruton ... £779

H. Gillingham, Sherborne ... 749

T. S. Hobbs, Bruton ... 720

Allen & Son,* Everecreech ... 700

* Accepted.

Southwold.—For sea-defence works, for the Corporation:—

A. G. Osenton, Tilehurst, near Reading ... £3,000 0 0

A. Fasey & Son, Leytonstone ... 2,657 16 0

T. W. Pedrette, Stamford Hill, N. ... 2,645 0 0

Pedrette & Co., Finsbury Park, N. ... 2,571 18 0

W. Fasey, West Ham ... 2,470 10 0

W. Gradwell, Barrow-in-Furness ... 2,351 19 2

G. Double, Ipswich ... 2,325 7 0

W. Rigby, Lewisham, S.E. ... 2,160 0 0

Campbell & Handman, London, E.C. ... 2,149 15 3

A. Thorne, Westminster, S.W. ... 2,120 0 0

J. C. Trueman, Swanley, Kent ... 2,112 0 0

E. H. Page,* Andrew's Buildings, Queen Street, Cardiff ... 1,418 7 0

* Accepted.

South Shields.—Accepted for the erection and completion of the whole of the buildings and other works required in connection with the public abattoir on vacant ground, Station Road, corner of Claypath Lane, for the Town Council. Mr. S. E. Burgess, M.I.C.E., borough engineer:—

R. Neill & Sons, Strangeways, Manchester £13,895

[NOTE.—Twenty tenders were received.]

A Sea-wall and Promenade at Southend is to be built at a cost of £67,000, less a contribution of £6,000 by Colonel Burges, the owner of property along the route.

The Architectural Review.

CONTENTS OF THE AUGUST ISSUE.

BRYDON AT BATH.—II. Rev. W. J. Loftie. With 7 Illustrations.

NOTES:

The British Designer.
The Improvement of the Marble Arch.
Christopher Kempster.
The Architect and the Press.

ENGLISH LEAD PIPE-HEADS.—I. Lawrence Weaver. With 15 Illustrations.

COMPETITIONS:

The Lambeth Municipal Buildings. Hall and Warwick, Architects.

A SKETCH OF IRISH ECCLESIASTICAL ARCHITECTURE. II.—Early Irish Churches. A. C. Champneys. With 17 Illustrations.

CURRENT ARCHITECTURE:

Brighton Premises, London and County Bank. Godfrey Pinkerton, Architect.

"Headingley," Cobham, Surrey. The late Francis W. Bedford, Architect. Completed by F. Radford Smith.

St. Matthew's Church, Stockholm. Erick Lallerstedt, Architect.

Additions to "The Islet," Maidenhead Court. R. Selden Wornum, Architect.

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St. Peter's Church, Lowestoft. E. P. Warren, Architect.

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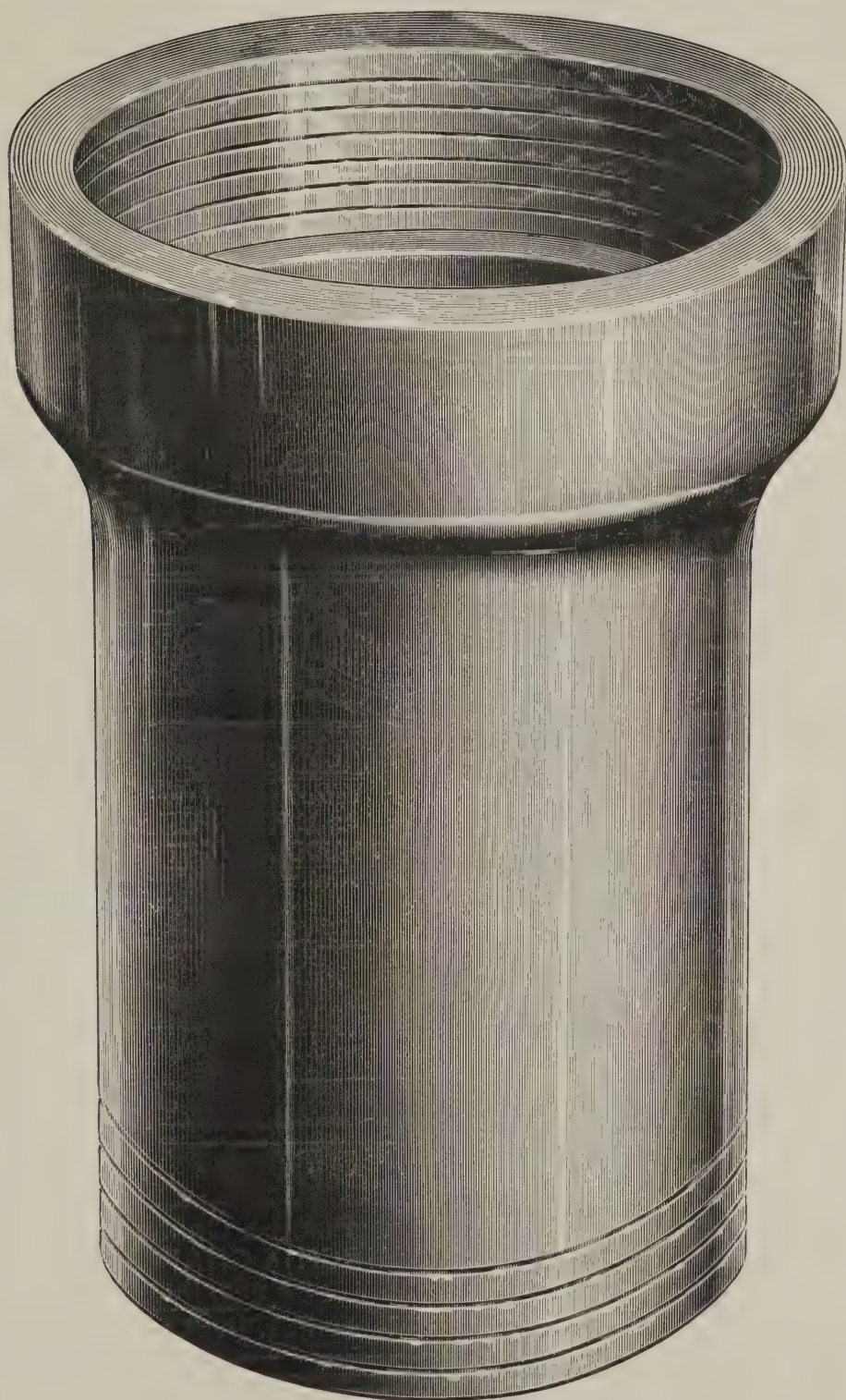
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	£	s.	d.	£	s.	d.
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Clover, best ... per load	3	12	0	4	0	0
Hay, good ... do.	3	3	0	3	10	0
Sainfoin mixture ... do.	3	7	0	3	15	0
Straw ... do.	1	12	0	2	0	0

OILS AND PAINTS.

Castor Oil, French ... per cwt.	1	0	5	—		
Colza Oil, English ... do.	1	2	6	—		
Copperas ... per ton	2	0	0	—		
Lard Oil ... per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate ... per ton	16	0	0	—		
Do. red ... do.	15	0	0	0	19	0
Linseed Oil, barrels ... per cwt.	0	17	10	0	18	3
Petroleum, American ... per gal.	0	0	5	0	0	5
Do. Russian ... do.	0	0	5	—		
Pitch ... per barrel	0	8	0	—		
Shellac, orange ... per cwt.	9	0	0	—		
Soda, crystals ... per ton	3	2	6	3	5	0
Tallow, Town ... per cwt.	1	5	9	—		
Tar, Stockholm ... per barrel	1	6	6	—		
Turpentine ... per cwt.	2	4	10	—		

METALS.

Copper, sheet, strong ... per ton	83	0	0	—		
Iron, Staffs., bar ... do.	5	12	6	8	0	0
Do. Galvanized Corrugated sheet ... do.	10	12	6	10	15	0
Lead, pig, Soft Foreign ... do.	13	18	9	14	0	0
Do. do. English common brands ... do.	14	0	0	14	5	0
Do. sheet English, 3lb. per sq. ft. and upwards ... do.	15	0	0	—		
Do. pipe ... do.	16	0	0	—		
Nails, cut clasp, 3in. to 6in. ... do.	9	5	0	—		
Do. floor brads ... do.	9	0	0	—		
Steel, Staffs., Girders and Angles ... do.	5	7	6	5	12	6
Do. do. Mild bars ... do.	6	0	0	6	5	0
Tin, Foreign ... do.	149	17	6	150	7	6
Do. English ingots ... do.	150	0	0	151	0	0
Zinc, sheets, Silesian ... do.	26	15	0	—		
Do. do. Vieille Montaigne ... do.	27	0	0	—		
Do. Spelter ... do.	24	15	0	25	7	6

TIMBER.

	£	s.	d.	£	s.	d.
Fir, Dantzic and Memel ... per load	2	15	0	5	0	0
Pine, Quebec, Yellow ... do.	4	0	0	7	10	0
Do. Pitch, American ... do.	3	0	0	5	0	0
Laths, log, Dantzic ... per cu. fath.	4	0	0	6	0	0
Deals, Sandarne, Yellow, 3rd, 4x9 ... per std.	12	5	0	—		
Do. Archangel, Yellow, low, 3rd, 3x11 ... do.	8	15	0	—		
Do. do. do. 3x11 ... do.	8	10	0	8	15	0
Do. do. do. 3x9 ... do.	9	10	0	9	15	0
Do. Mesane, Yellow, 3rd, 3x8 ... do.	0	15	0	—		
Do. do. do. 4th, 3x9 ... do.	8	15	0	—		
Do. Gefse, Yellow, 3rd, 3x9 ... do.	10	5	0	—		
Do. Skutskai, Yellow, 1st and 2nd, 3x7 ... do.	10	15	0	11	0	0
Do. Räfsö, Yellow, 2nd, 3x5 1/2 ... do.	9	0	0	—		
Do. do. do. 2 1/2 x 7 ... do.	9	5	0	9	10	0
Do. Christiansand, Yellow, Unsorted, 3x4 ... do.	7	15	0	—		
Do. Skelleftea, Yellow, low, 1st, 2 1/2 x 7 ... do.	9	10	0	—		
Do. do. do. 2nd, 2 1/2 x 7 ... do.	9	0	0	—		
Do. Stingsund, Yellow, 4th, 2 1/2 x 7 ... do.	9	5	0	—		
Do. Riga, White, Unsorted, 2 1/2 x 7 ... do.	7	15	0	8	0	0
Do. Quebec, Spruce, 4th, 3x9 ... do.	8	0	0	—		
Battens, all kinds ... do.	6	10	0	11	10	0
Flooring Boards in prepared, 1st ... per square	0	10	3	0	11	0
Do. 2nd ... do.	0	10	3	—		
Do. 3rd, &c. ... do.	0	7	3	—		

HARD WOODS.

Ash, Quebec ... per load	3	17	6	7	5	0
Birch, New Brunswick ... do.	2	5	0	4	17	6
Do. Quebec do. ... do.	2	10	0	5	0	0
Box, Turkey ... per ton	7	0	0	20	0	0
Cedar, Cuba ... per ft. sup.	0	3	1/2	0	0	4

Coming Events.

Saturday, August 26.

NORTHERN ARCHITECTURAL ASSOCIATION. — Students' Sketching Club Excursion.

Saturday, September 2.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS. — Midland District Meeting, Kettering.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Ad.—Adjudication.]

W. C. BUTLER, builder, Bow and Leigh. Liabilities £1,730; estimated surplus £610.

J. FORBES, builder, Blackhall, Edinburgh. Liabilities £1,256; assets £300.

J. M. STRATTON, builder, Verwood, Salisbury. Liabilities £818; assets £531; deficiency £287.

ARNOLD BELL & Co., builders, Bromley. R.O. Aug. 10th.

D. BLOOM & Sons, builders, Liverpool. R.O. Aug. 11th.

W. HOOSON, builder and contractor, St. Anne's-on-Sea (late Halifax). P.E., Halifax C.C., Oct. 2nd, at 2.

J. JEFFRY, plasterer, Cosby. P.E., The Castle, Leicester, Sept. 15th, at 10.

LOGSDAIL & BEALE, surveyors, Kentish Town and New Eltham. Adj. Aug. 10th.

J. S. DOUGLAS, builder, Fittsford and Northampton. Adj. Aug. 10th.

FOREMAN BROTHERS, sanitary surveyor, Upper Newwood. Adj. Aug. 10th.

G. A. SHAND, plasterer, Halton (late Hastings). P.E. Hastings Town Hall, Oct. 10th, at 12.

G. KING, painter, Senghenydd. P.E., Pontypridd C.C., Sept. 5th, at 11.15.

W. ELSDON, builder, Clapham Park. Liabilities £110,483; assets £9,667.

J. HODGE, builder, Falkirk. Liabilities £4,198; assets £173.

T. KELL, bricklayer (late builder), South Shields (late Bedlington). P.E., Newcastle-on-Tyne C.C., Oct. 3th, at 11. Amended notice.

WARNER & CREE, builders, Leicester. P.E., The Castle, Leicester, Sept. 15th, at 10. Unsecured liabilities £579; assets £229.

G. BUXTON, builder, Wimbledon. First meeting, 24, Railway Approach, London Bridge, S.E., Aug. 25th, at 12.30. P.E., Kingston C.C., Sept. 12th, at 2.30.

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THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

August 30, 1905. Vol. 22, No. 551.

6, Great New Street, Fetter Lane, E.C.

Summary.

Of the late Mr. Alfred Waterhouse the "Times" says: "Whatever his defects of taste, a man who had such capacity and readiness in planning and designing buildings on a large scale, and who seemed able to grasp and deal with every practical problem in building as soon as it was presented to him, was essentially a great architect." (Page 125.)

The correspondence about the restoration of Iona is now about concluded. One critic says that the charm of the place has been wholly destroyed by the unholy and violent hands which mis-called "restorers" have laid upon it, to its most effectual and irretrievable disfigurement and wrecking. (Page 118.)

Some very interesting old Tudor wood-work has been uncovered in the course of alterations to Picton House, Hackney. (Page 116.)

Vitrified brick, laid in neat cement, has the greatest crushing strength of any of the incombustible and otherwise indestructible materials. (Page 117.)

A correspondent who has had between thirty and forty years' experience asserts that concrete does not expand to any appreciable extent in floors, walls, &c. (Page 122.)

Mahogany was first introduced into England about 1720. (Page 122.)

Among successful practitioners in the United States an undue proportion are men who owe their success to their abilities as organizers, promoters and business men rather than as designers, as architects. (Page 126.)

Photographs in the Architectural Association competition are to be submitted by October 1st. (Page 121.)

The long-drawn-out strike among the bricklayers at Newcastle has been settled. The wages are to be 9½d. per hour; piece-work rules are to be established; and in future disputes a conciliation board is to be called together. (Page 121.)

A scheme of cheap cottages after the manner of Letchworth has been commenced by a Fleetwood company near Blackpool. The first cottage has cost £180, including cartage and extras. (Page 119.)

Twelve large Boyle "Air-pump" ventilators with a diameter of shaft of 2ft. 6ins. have been fixed on the roof of Cannon Street Station, and prove very effective in clearing the air. (Page 121.)

Mr. Hare thinks that the rule-of-thumb standard of floor-space per reader in libraries is generally inadequate. (Page 126.)

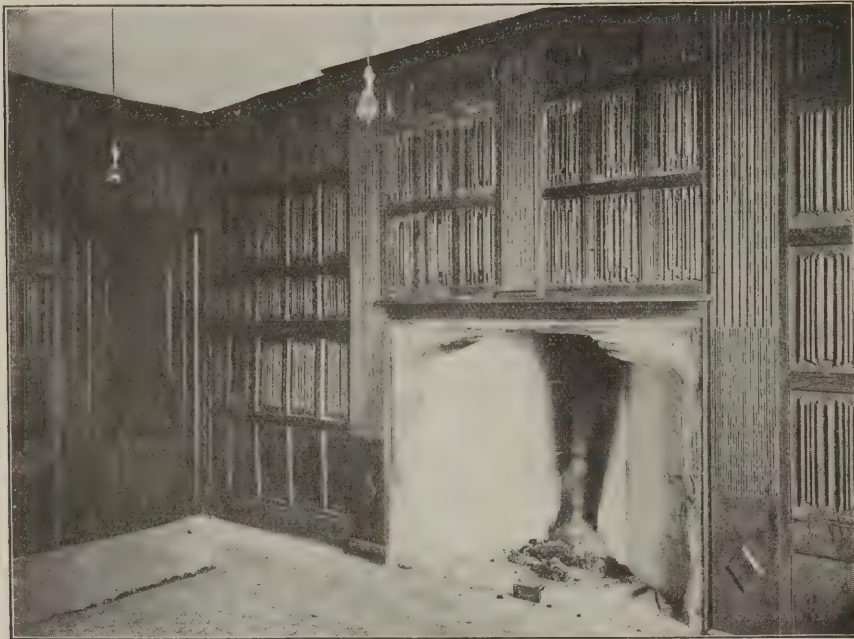
Wide Streets and Open Spaces.

THE existing by-laws of this country have been subjected to much adverse criticism, and all sorts of ill-effects have been attributed to them, but very few persons have made suggestions complete enough to bear serious scrutiny. Of course the desire on the part of many people to do without any laws or regulations can be dismissed as altogether impracticable, and as tending only to a worse state of affairs than exists at present. It is a peculiar thing that all those who have come forward with suggestions for reforming the by-laws, instead of lessening their severity, have generally ended in increasing them. The latest proposal, and one which deserves investigation, is that of Mr. Isaac Richmond Dixon, of Manchester, who has written a long letter to the press in which he summarizes the progress made in the direction of housing reform in various towns in Germany. He reminds us that since March, 1901, every German town has been compelled to adopt a housing scheme by order of the Imperial Government. The powers given to the municipalities touch the root of the problem in so far that they provide facilities for the purchase of land in the immediate neighbourhood of towns and for the laying down of an organized system of thoroughfares, the adoption of which is made compulsory on all landowners who develop their estates for building purposes. Mr. Dixon suggests that the Local Government Board's model code of by-laws should be made stringent in regard to the width of roads and the amount of open space in connection with every building. He proposes that all yards of domestic houses should be not less than 40ft. super., as against the present 150ft. super., and that all new roads 150 yds. long should be 12 yds. wide; if 250 yds. long 14 yds. wide, increasing by 2 yds. width for every additional 250 yds. in length up to 2,000 yds., above which the maximum should be 30 yds. There seems to be no valid objection to increasing the open spaces in cities, for quick transit is now possible, and there can be no vested interest in land in the suburbs. The present ability of landowners to hold land until they can obtain an exorbitant price for it is simply iniquitous, and is the primary cause of overcrowding. The leasehold system, indeed, should be done away with. When we come to Mr. Dixon's other suggestions, we must say we think they are fatuous. He suggests that all foundations should be covered with cement-concrete or asphalt; that no staircases should be steeper than 45 degs., and should have a window opening to the outside and a handrail; that no living or

sleeping room should be less than 144ft. super.; no materials from demolished buildings should be used; and better mortar should be provided. In regard to the first of these suggestions to cover all the site with concrete, this is not hygienically necessary in all cases; it depends upon the subsoil. As to the second suggestion, an examination of architects' plans will clearly show that staircases can be so arranged that no such necessity arises and a hard-and-fast rule like this would only lead to extra expense. As to increasing the area of rooms, this would greatly increase the cost immediately. It depends upon the purpose for which the room is to be used as to what size it should be, and restrictions in this respect are inadvisable. As to old materials, they are seldom infectious, and when they are they can be disinfected.

Structural Accidents.

THE collapse of buildings from faulty construction has to be continually noted, and the difficulty of assigning blame makes it desirable that there should be some alteration in the existing law. The trouble arises in every country, and in some is far more acute than it is here. In the United States, where some shocking fatalities have occurred, an expert commission appointed by the Superintendent of Buildings in New York to investigate the collapse of a number of structures which fell at the beginning of the spring thaw has recommended that architects should be required by law to supervise the construction of buildings for which they have furnished plans, and that before a person is allowed to practice as an architect he should hold a diploma from some institution of learning or a recognized board; that all contractors for masonry, brick or structural steelwork should be licensed, it being unlawful for anyone unlicensed to carry out such work. The commission thought that such enactments would make the recurrence of similar accidents practically impossible and render the inspection of work in progress by municipal officials a matter of secondary importance. From this we may judge that not only would the authorities in the States have architects registered, but contractors also. It is apparent, however, that the architect should not be expected to give all the superintendence that is necessary to prevent faulty construction. He has to depend upon clerks of works and contractors; and the plan of the German Government in making all those responsible for the erection of buildings pass examinations before they are allowed to practise their respective professions and trades is therefore a wise one, and worthy of general adoption.



COMMITTEE-ROOM, HACKNEY CHURCH INSTITUTE.

OLD TUDOR WORK IN HACKNEY.

THE accompanying photographs show some interesting old woodwork which has been discovered in the course of alterations made to an old house in Hackney. This is Picton House, High Street, Homerton, which has of late years been used as the St. John's-at-Hackney Church Institute. The house was condemned by the London County Council as unsafe, but rather than let such an interesting landmark disappear the Rector of Hackney (the Rev. and Hon. A. G. Lawley) started a restoration fund, which amounted to about £3,000. The building was placed in the hands of Mr. Sydney Jeffree, of 9, Southampton Street, Holborn, W.C., who entered into the enterprise in a very praiseworthy spirit, and has taken extraordinary precautions to preserve everything of interest. Associated with Mr. Jeffree was Mr. Lionel Crane.

It will be seen from the plan that he has extended the accommodation by erecting a kitchen and offices, and a hall for meetings. These harmonize very well with the character of the old work, Luton bricks having been used to obviate the great contrast between the new and old work, which is in red brick, time-stained, almost black.

The courtyard, shown on the plan, was formerly roofed in with a collection of tumble-down sheds, but these have been cleared away, showing some fine old chimneys and brickwork.

All the old glass in the windows and the tiles on the roofs have been preserved as far as possible, and the old oak woodwork cleared of the many coats of paint with which some vandals had obscured it, though the front doors still await this cleaning process.

In the course of renovating the larger billiard-room on the first floor some fine old oak panelling was discovered underneath the wallpaper (shown in the view on p. 118). The panels over the fireplace are finely carved.

Similarly, the smaller billiard-room was found to be panelled in oak, and the fireplace, when uncovered, still disclosed the original painted panels in the spandrels of the arch. The two coats-of-arms shown in the view also preserve their original colouring.

The committee-room on the ground floor was also found to have oak panels carved peculiarly with a kind of imitation of folded linen. The two side pilasters were discovered in the cellar, and fit exactly into the positions

they now occupy; the bases only needed to be restored.

Plain oak panelling was found beneath the paper in the social room on the first floor (see p. 118), and the new portion that has been necessary to give continuity harmonizes well with it. There are some fine hand-turned balusters to the stairs. An old six-light window looking from the inner hall into the courtyard, constructed of oak mullions, has been repaired, and a number of bedrooms have been constructed in the attics, the old wooden tie-beams being preserved and exposed where below the ceiling level.

The secretary's room is panelled in woodwork of the Georgian period, painted white, and though of a different style is distinctly fine. The building dates in the main from the early Tudor period, but the old oak woodwork and panelling probably belong to an earlier building. Among the former occupiers were Thomas Sutton, founder of the Charterhouse, General Picton (of Waterloo fame), Nicholas de St. Croix—the French political reviewer, and Dr. Burnett, the schoolmaster, who numbered the great Lord Lytton among his pupils.

Messrs. Patman & Fotheringham, Ltd. (managing director, Mr. James F. Parker), of 100 and 102, Theobald's Road, London, and Islington, deserve praise for the great care and interest they have taken in the alterations which they have executed at this old house.

The oak panelling was restored by Messrs. Keble Brothers, of Carlisle House, Soho Square.

INTERNATIONAL HOUSING CONGRESS AT LIEGE.

THE seventh International Congress on Housing recently met at Liège, when the secretary was able to report that the membership numbered upwards of 700 and that they belonged to eighteen different countries. Delegates were present from all parts, those from France and Belgium being in the majority.

The first discussion dealt with the methods of public intervention in the supply of cheap dwellings, a subject which is not often discussed in England, but in Germany it was stated much is done in certain districts in the loan of capital to building societies either by the municipal savings banks, by hospital trustees, or by other public bodies who require a safe investment.

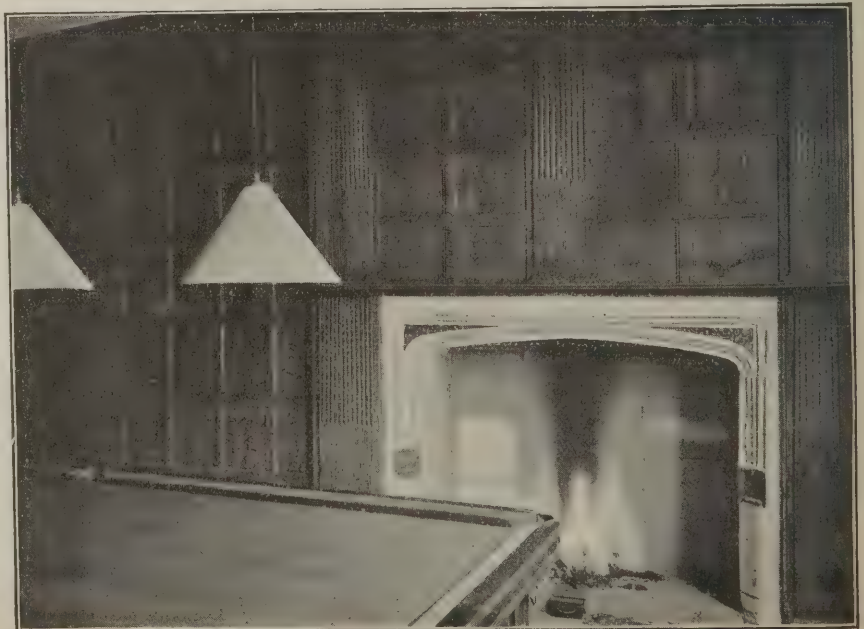
The second discussion was a highly technical one, on the incidence of taxation.

Sanitary Inspection.

The third matter discussed dealt with sanitary inspection, and on this all the delegates found themselves in accord. Systematic inspection, house by house and street by street, said one delegate, was what was required; and speaker after speaker simply repeated this. It was pointed out that inspection was economical when seriously undertaken and well done, since it prevented evil conditions from coming into existence. But the service required trained men and women, sufficiently numerous to enable them to work efficiently, and, above all, the loyal co-operation with these experts of the general body of citizens.

The Plotting of Towns.

The fourth section embraced the whole subject of the plotting of towns, and also a discussion on garden cities. The most valuable papers in this section were contributed by representatives of Germany, where, as is well known, the plotting of towns with due regard to their regular and orderly development is now a definite duty thrown on the municipality. Mr. Horsfall, of



SMALL BILLIARD-ROOM, HACKNEY CHURCH INSTITUTE.

Manchester, was among the speakers who urged the need for further steps in this direction. The garden city movement received generous support, although many delegates felt that garden cities could only touch a very small part of the problem of housing the masses. The secretary of the Congress, Professor Mahaim, of Liège, opened a useful discussion on the need of special enquiries as to housing conditions in different towns. Evidence was brought forward to show that only when the results of such enquiries, scientifically carried out, were available was it possible to say what had to be done in a town. The question of improving the appearance of workmen's dwellings without adding to the cost was also considered. Simplicity and directness were called for, and the abolition of false ornament, on the authority of Ruskin and Morris.

The final session of the Congress discussed workmen's gardens, the provision of allotments, and the utilization of what are called in America "vacant lots."

An International Committee.

A resolution was passed at the close of the discussions proposing the constitution of a permanent international committee to have an oversight of the matters considered by Congress. It was decided that the committee should consist of representatives from each of the countries taking part in the Congress, and that it should have its headquarters in Brussels. Mr. Lepreux, the president of the Congress, was elected first president of the committee. The English representatives appointed were Alderman Thompson, of Richmond; Mr. Horsfall, of Manchester; and Mr. H. R. Aldridge, secretary of the National Housing Reform Council. The last-named put forward, on behalf of the English delegates, an invitation to hold the next Congress in England in 1907—an invitation which was accepted.

CRUSHING STRENGTH OF PIERS.

ONE of the most interesting exhibits at the St. Louis Exposition, says Mr. George J. M. Ashby in the "Clay Worker," was that of the Watertown Arsenal tests, shown at the west end of the Government Building. The exhibit contained all the information on the face of it. There were twelve columns of equal dimensions. The rods on the outside of the brick and concrete columns which had been subjected to the crushing test served the purpose of holding them together. Signs told that these columns were "specimens of constructive timber, brick and concrete pillars, and columns tested at the Watertown Arsenal Testing Laboratory, Watertown, Mass."

Reading from left to right, the first five columns were timber. The first of these was Douglas fir or Oregon pine; the crushing strength was 732,000 lbs., or 6,360 lbs. per sq. in.; moisture 11.3 per cent. The next was long-leaf pine; crushing strength 616,300 lbs., or 4,400 lbs. per sq. in.; moisture 26.9 per cent. The third was short-leaf pine; crushing strength 504,000 lbs., or 3,780 lbs. per sq. in.; moisture 30.7 per cent. Next was spruce, 392,000 lbs., or 2,780 lbs. per sq. in.; moisture 42.2 per cent. The last timber was basket oak, showing a resistance to crushing of 431,000 lbs., or 2,950 lbs. per sq. in.; moisture 35.8 per cent.

Next in order were three concrete columns. The first of these was composed of Portland cement 1, sand 2, pebbles 4, and was reinforced with eight twisted steel bars. The age at time of testing was three months fifteen days; the crushing strength was 497,000 lbs., or 3,160 lbs. per sq. in. The second concrete column had a composition similar to the first, but was not reinforced. The age at testing was three months and seventeen days, the crushing strength was

272,000 lbs., or 1,710 lbs. per sq. in. The third concrete column, having a similar composition of cement, sand and pebbles, was reinforced with four corrugated bars; the age was three months sixteen days, the crushing strength 349,100 lbs., or 2,180 lbs. per sq. in.

The centre of the exhibit was occupied by three portions of columns, showing the method of reinforcing with steel bars.

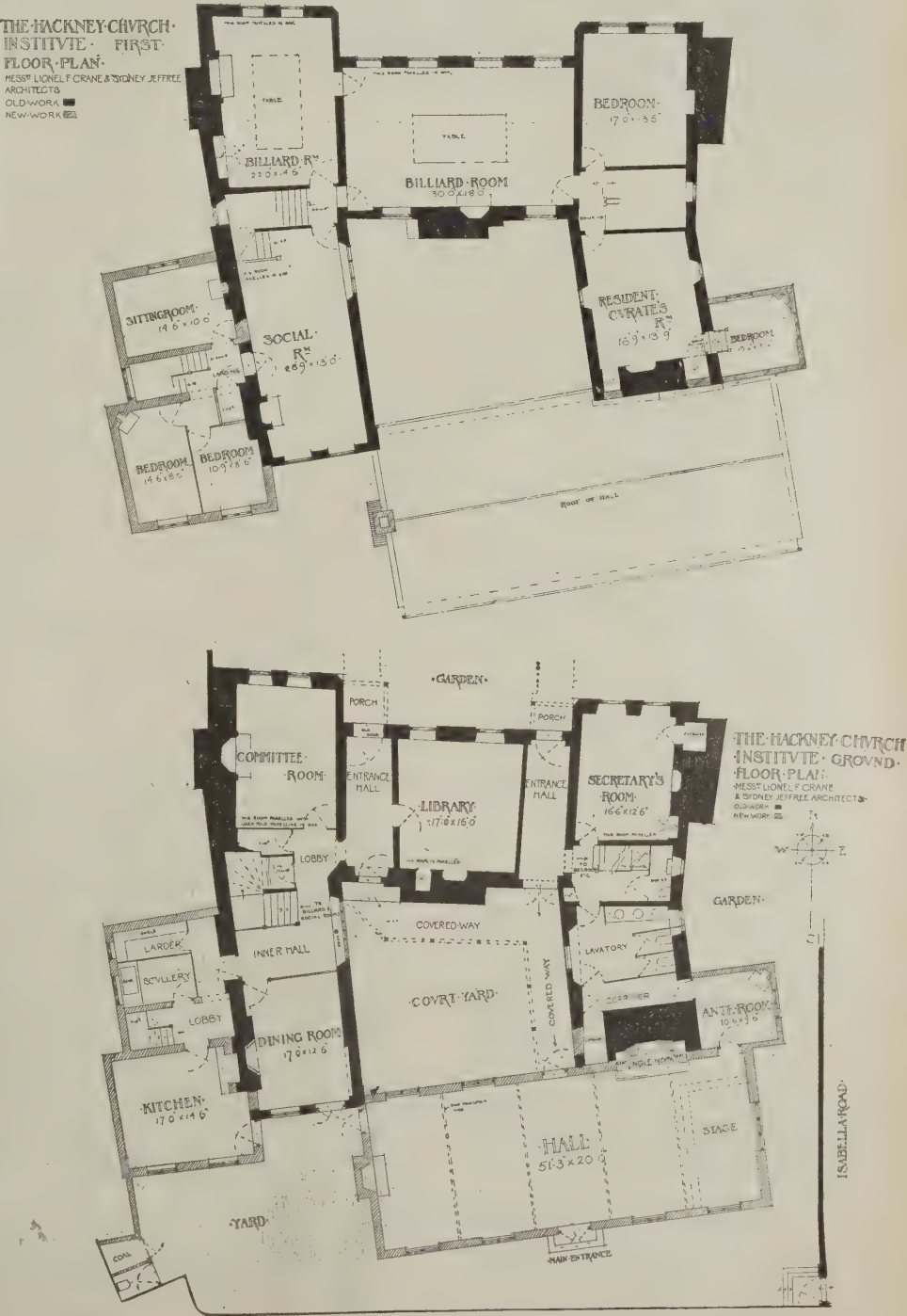
The last four columns were brick. The first of these was labelled "hard brick," laid in neat cement, age one month. The crushing strength of this was 623,600 lbs., or 4,700 lbs. per sq. in. The next "light hard brick." This was laid in lime-mortar—lime 1, sand 3; age twenty-four days. The crushing strength was 69,200 lbs., or 465 lbs. per sq. in. The third column was "wire-cut brick." This is a side-cut brick, laid in cement mortar, of cement 1, sand 2; age twenty-five days. The crushing strength was 342,000 lbs., or 2,410 lbs. per sq. in.

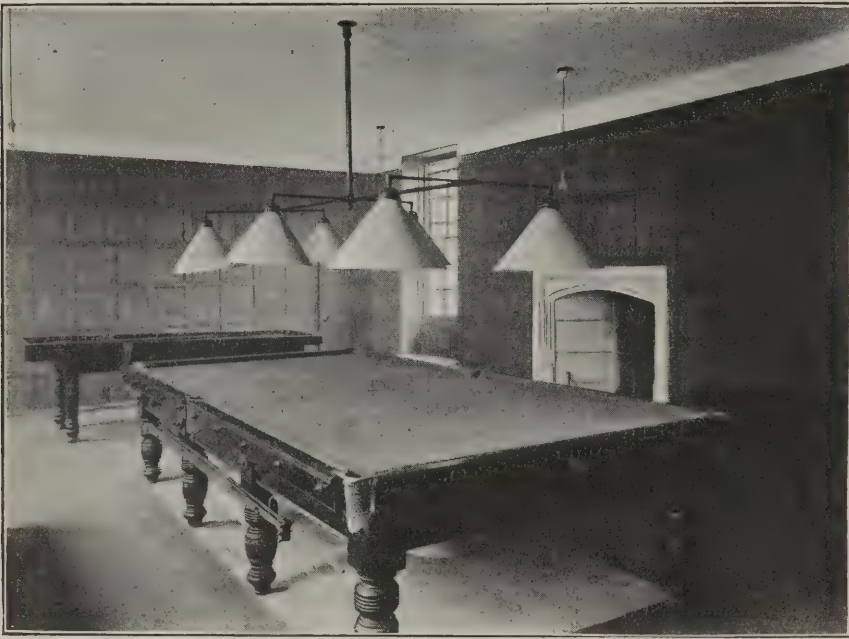
The last column was "dry-pressed brick," laid in neat cement; age one month. The crushing strength of this was 402,000 lbs., or 2,880 lbs. per sq. in.

By this it is seen that the vitrified brick, laid in neat cement, has the greatest strength of any of the incombustible and otherwise indestructible materials.

It was a very instructive and interesting exhibit, although the Government test merely gives a perfectly impartial statement of one set of comparative facts.

A new Baptist Church at Doncaster is being erected in Late English Gothic style at a cost of £3,500. The walls are faced with red Conisbro' bricks, with dressings to doors, windows, spire, &c., of Hathern terra-cotta. The roof is covered with Welsh slates and the ceiling is of pitch-pine. The architects are Messrs. John Wills & Sons, of Derby and London, and the contractors Messrs. H. Arnold & Sons, of Doncaster.





LARGE BILLIARD-ROOM, HACKNEY CHURCH INSTITUTE.

IONA CATHEDRAL.**More Criticisms of the Restoration.**

IN continuation of the letters by Mr. Honeyman and Mr. Champneys upon the restoration of Iona Cathedral, published in our issue for August 16th, we now give two further contributions to the controversy.

Mr. M. E. M. Donaldson writes: "Certainly for anyone who entertains any veneration for the past, the charm of Iona is wholly destroyed by the unholy and violent hands which mis-called 'restorers' have laid upon it, to its most effectual and irretrievable disfigurement and wrecking. Anything more hideous than the aggressive modern roof superimposed upon those ancient walls is inconceivable; certain it is that they will not be long able to support the indignity. Already ruin more complete than that wrought by centuries of stormy climate has been accomplished by the 'restorer.' Better, surely, a thousand times that the ruins should perish naturally (though this could be averted without rebuilding operations), and in their natural decay retain the old associations, than succumb to wrecking artificially and prematurely wrought, depriving them of all historic and antiquarian interest. As it is, yet another holy place is defiled and outraged.

"The Society for the Preservation of Ancient Buildings has already expressed its opinion on the use of a green roof and American oak scantlings without tie-beams; and with most people their specialist collective pronouncement will carry more weight than that of one individual, however distinguished. To talk of 'preservation' rather than 'restoration' in the face of the monument of ugliness, desecration and execrably bad taste erected in Iona is the sheerest nonsense. One would imagine that wholesale rebuilding operations were the only means of staying the ravages of time. Truly did Ruskin say that 'restorations' were either architects' jobs or ministers' vanities': they also spell the abomination of desolation—destruction. Have any preservatives ever been applied to the priceless crosses and their inefficacy proved that these monuments must needs be rooted from their ancient sites (as the guide announced was the intention) to the shelter of the appalling roof? We shall next hear of some 'enlightened scheme to preserve' Fountains Abbey by re-roofing; and of another to remove Stonehenge to the shelter of the nearest barn! Give, oh give us the 'ignorance' of Mr. Champneys in preference to the

superior knowledge of Mr. Honeyman if it leads to such iniquities as one now sadly witnesses in Iona. Would that contributions to the funds for 'restoration' had been much less than apparently they have been. If there is any good taste or a sense of the fitness of things yet left in Scotland, they will wholly cease when it is seen of what enormities 'restoration' as exhibited in the doubly-ruined ruins of Iona is capable."

Another Reply by Mr. Honeyman.

Mr. John Honeyman in reply says: "I have no wish to continue discussing points raised by Mr. Champneys in the columns of the daily press, but it is possible (though unlikely) that I may do so in our professional journals.

"I am disposed to agree with Mr. Champneys in one thing, namely, that when matters of fact only are under discussion it is right to omit such terms as 'ridiculous,' 'absurd' and the like. Still, in some circumstances even stronger terms may be legitimately used, and I think I may be pardoned if I partially 'relieve my feelings' by saying that I regard

the letter of your correspondent M. E. M. Donaldson as merely a tissue of hyper-sentimental foolishness, to which I could reply but would never dream of doing so. I was for many years a member of the Society for the Protection of Ancient Buildings, but when the Society departed from its original purpose and became practically a Society for the Destruction of Ancient Buildings—insisting that (like Mr. Donaldson) they should be allowed to go to rot—I left it.

"Perhaps I should explain that the much-abused roof was on the choir more than a year before I was consulted by the trustees, but I may add that there is abundant evidence to show that the slates on the old roof were at one time of exactly the same colour."

Mr. Champneys' Retort.

To the foregoing Mr. Champneys replies as follows:—

"Mr. Honeyman's consistency is certainly exhibited in his retirement from any society for the protection of ancient buildings—whatever precise form its principles may have assumed. I wonder whether the old slates to which he refers may not belong to the seventeenth-century repairs; also, whether the new form of internal roof (which he has himself introduced into the north transept) is, apart from all other considerations, as safe as that with the old flat ceilings. However, Mr. Honeyman having now retired from the correspondence on the subject, I shall not say more on any points that can be questioned, but merely state the position in which his letters leave the trustees, though this is sufficiently obvious. Subscriptions were asked for the restoration of Iona Cathedral. As to the north transept, their architect says: 'There is no restoration at all, nor any attempt at restoration'; and 'the gable is in no sense a restoration—it is a new design,' &c. The same statement is made in other words, but not less plainly, about the carving at the entrance to the sacristy; and as regards the greater portion of the internal roofing, and a certain part of the plaster, it is admitted. The trustees, then, are in the position of having asked money for one thing and allowed it to be spent on another."

New Chapel at St. Paul's.—At St. Paul's Cathedral the south-western chapel is being fitted up for the Knights of St. Michael and St. George, under the direction of Mr. Somers Clarke.



SOCIAL ROOM HACKNEY CHURCH INSTITUTE.

CHEAP COTTAGES.

A Seaside Scheme.

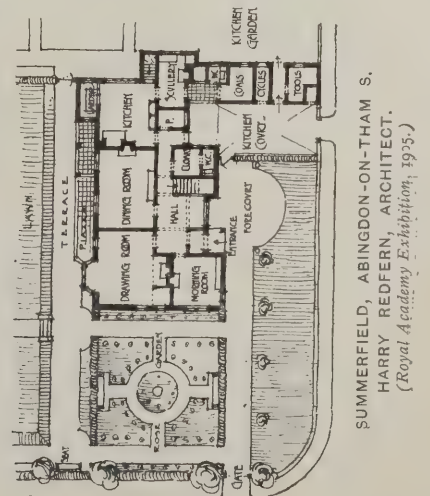
AT Thornton, near Blackpool, a Fleetwood company has an extensive tract of land, and a large portion of it has been set aside for the building of cheap cottages. The company has worked out its scheme somewhat on the lines of Letchworth, the sum of £150 being fixed as a basis of cost per cottage. The first cottage is now completed and tenanted, and the cost has worked out at £180, including carriage and extras. The plans comply with the by-laws of the Thornton Urban District Council. The company has purchased its own materials and sublet the labour. Materials are not specially cheap. The bricks had to be conveyed from Blackpool, and the tiles were from Staffordshire, but there is some advantage in having timber so near at hand as the Fleetwood dock. The cottage stands in its own garden, and has picked grey headers to the first floor and above, cement rough-casted and limewashed, with half-timbered gable and tiled roof. The living-room is 17ft. 3ins. by 12ft.; scullery, 11ft. by 10ft.; and the bedrooms are respectively 12ft. by 12ft., 8ft. 6ins. by 8ft., and 11ft. by 10ft. The height of all the rooms is 9ft. and cubical contents of bedrooms 2,916ft. The cost of the cottage works out at 4½d. per ft. cube. There is no bathroom, but the plan is so arranged that this additional convenience could be added over the porch at a cost of about £20. The washhouse and other offices are separately built at the rear of the back garden. Another cottage in progress is of a bungalow type and is estimated to cost £154. It will provide a kitchen 15ft. by 11ft.; scullery, 7ft. 6ins. by 7ft. 3ins.; pantry, 4ft. 3ins. by 3ft.; two bedrooms, 10ft. by 7ft.; and one bedroom, 10ft. by 9ft. The cubical contents of the bedrooms will be somewhat less than in the two-storey building, namely, 1,980 cub. ft.

Obituary.

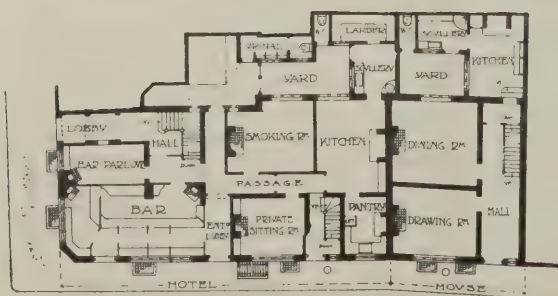
Mr. Thomas Sharples, for thirty years general secretary of the Amalgamated Society of Painters and Decorators, died recently at Greenheys, aged 86 years.

Mr. Joseph Howe, head of the well-known contracting firm of Messrs. Joseph Howe & Co., of West Hartlepool, died recently, aged 55.

Mr. Duncan Stewart, of the firm of Messrs. Duncan Stewart & Sons, builders and contractors, Wallington, who died on May 9th, aged 67, left estate of the gross value of £59,487.

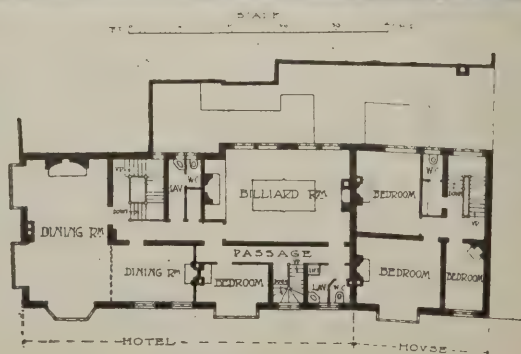


SUMMERFIELD, ABINGDON-ON-THAM S.
HARRY REDFERN, ARCHITECT.
(Royal Academy Exhibition, 1905.)



KING ST

GROUND PLAN



FIRST FLOOR PLAN

EAST GATE HOTEL, CORNER OF HIGH AND KING STREETS, OXFORD. EDWARD P. WARREN, ARCHITECT.

Ground-floor walls are faced with Brise Norton hammer-dressed and coursed rubble, the dressed stone being Monk's Park. The walls of the upper floors are of rough-casted brick. The roof is covered with green slates. The sign was designed and executed by Mr. George Simonds, sculptor, in coloured cement, and represents the old East Gate, which stood about this point. The builders were Messrs. Benfield & Loxley, of Oxford.

Keystones.

Ayr Brig is being inspected by many architects in consequence of Lord Rosebery's appeal through the press. Mr. Francis Fox, M.I.C.E., of Sir Douglas Fox & Partners, is to give a report to the Ayr Council, without fee, and Mr. John Strain, M.I.C.E., and Mr. John Carruthers, M.I.C.E., are numbered among those who are to give a gratuitous opinion on the ancient structure.

"Triumphs of Modern Architecture."—An article on this subject, by Mr. Hugh B. Philpott, appears in "Cassell's Magazine" for September. It is illustrated by a number of drawings and photographs, including some of Westminster Cathedral, Liverpool Cathedral, the Chartered Accountants' Hall, Lloyd's Registry, the new Sessions House, Cardiff and Sheffield town halls, the Rylands Library at Manchester and the M'Ewan Hall at Edinburgh.

Kingsway: Expected to be Finished by November.—The new thoroughfare from the Strand to Holborn, which is to be known as Kingsway, is now rapidly approaching completion. The section between Great Queen Street and Holborn has been finished some time, and between Great Queen Street and what used to be Sardinia Street the road and subways are in various stages of incompleteness. From Sardinia Street to Aldwych a great deal remains to be done, and some delay has been caused in arranging the drainage of a new side street. The portion opening into Aldwych is, however, sufficiently forward to allow of its being brought into use whenever the northern end of the section is completed. The Works Department of the London County Council confidently expects that the whole thoroughfare will be completed before November 8th, on which date it is hoped that His Majesty the King will perform the formal opening.

York Architects in Sheffield.—The members of the York Architectural Society recently visited Sheffield in order to see some of the new buildings which have been erected for educational purposes. Chief among these are the new University buildings in Western Bank. Here the visitors were joined by many members of the local society, and the combined party was conducted over the buildings by the architect, Mr. E. M. Gibbs. At the conclusion of the inspection the party left by special tramcar for Nether Green Council School, where the members were met by Mr. A. F. Watson, the architect of the building, who conducted them round.

Old Lead Tank at Richmond.—In a recent issue we illustrated a very interesting old cast-lead tank at 11, The Green, Richmond. We have now received a letter from Mr. W. I. Chambers, architect, saying he is anxious that any student or others desirous of seeing the tank and other interesting items in the house should have an opportunity of doing so, but he must confine their visits from 2 till 6 on Saturday afternoons only, as since the insertion of the illustration his house has been invaded by students and archaeologists at all inconvenient hours of the day. He also desires to say that he will obtain a list of the best things to sketch in Richmond (which we will publish) and that he must decline to answer any more letters on the subject.

Ventilation of Cannon Street Station: Curious Result.—Cannon Street Station was built during the years 1864-66, and the station was opened for traffic on September 1st, 1866. The roof is of wrought-iron with a single span. During the forty years which have elapsed since its construction, it has been painted several times, but owing to defective ventilation and to the action of the

gaseous fumes given off from locomotives the ironwork had become much corroded and weakened, while the covering was in a more or less leaky condition. It was found that the ironwork at the south end of the station was in the worst condition, the atmosphere being generally much fouler at that end. This is due to the fact that the engines of trains leaving the station give off a great deal of steam and sulphurous vapours in getting up speed, and in moist or foggy weather these vapours do not readily disperse, but hug the back of the screen. Additional ventilation has been obtained by adding twelve large Boyle "Air-pump" ventilators, with a diameter of shaft of 2ft. 6ins. These have proved effective, the atmosphere being now much clearer than was the case before the alterations. A curious circumstance is that the glazing requires washing only on the outside, the inside remaining perfectly clean.

OUR PLATES.

THE house at Reigate is to be built of red bricks and tiles; the bays are to be covered with cast-lead between the heads of the ground-floor windows and the sills of the first-floor windows.

The house at Bickley Park is built of red bricks, roofed with dark red hand-made Wrotham tiles. The builder was Mr. P. F. Duthoit, of Bromley, Kent.

Competitions.

Palace of Peace at the Hague.—The conditions of this competition are given in the R.I.B.A. Journal for August 26th.

New Assurance Offices at Cape Town.—Forty-six sets of designs have been submitted for new chief offices of the Southern Life Assurance Co. in St. George's Street, Cape Town. Six sets were disqualified. The first premium of £250 has been awarded to Mr. John Lyon, of Cape Town.

Council Schools, Bolsover.—In the recent competition for three council schools at Bolsover, for the Derbyshire Education Committee (limited to architects in the county of Derby), the first place for the Stanfree School has been secured by Mr. Clarence R. Ross, of York Chambers, Long Eaton, while for Langwith Bassett and New Bolsover the successful architect is Mr. H. Tatham Sudbury, of Lord Haddon Road, Ilkeston. Both have been engaged by the committee to carry out the works.

A Photographic Competition is held annually by the Architectural Association Camera and Cycling Club, and is open to all members of the architectural profession. The council of the Association offer a prize of three guineas for the best set of prints submitted. The main conditions are as follows:—(1) The competition is confined to sets of photographs adapted for the purposes of architectural study. (2) Each set should consist of not more than twelve prints and should illustrate one subject or class of subjects. (3) Copies of the winning prints by a permanent process must be deposited with the Architectural Association before the prize is presented to the winner. (4) Photographs must be sent to the secretary of the A.A. Camera and Cycling Club at 18, Tufton Street, Westminster, not later than October 1st. (5) The judging will be first of all by the committee of the Camera and Cycling Club as to the prints which reach a fair standard of technical excellence; they will then be finally adjudged by an authority on architecture (not a photographer) appointed by the president of the Association. The judge appointed by the president this year is Mr. Arthur Stratton.

Builders' Notes.

The Bridge over the St. Lawrence, at Quebec, now being constructed, has two approach spans of 100ft. each, two shore arms 500ft. in length, and a great central span of 1,800ft.—the longest yet built.

Uganda Bricklayers form a Union.—The whole of the industrial undertakings of the Church Missionary Society in Uganda have just been taken over by a public company, and some of the small chiefs, who act as foremen bricklayers or head men, have formed themselves into a sort of union for the purpose of regulating the number of apprentices admitted.

Nottingham Building Trade Dispute.—It would appear that, as a result of a joint conference last week between representatives of the masters and men, the threatened strike in the Nottingham building trade may, after all, be averted. A settlement has been arrived at upon the vexed question of "walking time," and the proposals as to a standard rate of wages and the letting of contracts are in a fair way of settlement.

The Screw Trade.—It is reported that an arrangement has been arrived at between British and German makers in the screw trade by which the severe competition which has prevailed for so long in this branch will come to an end. It is announced that a syndicate has been formed embracing all the makers in the trade, and that one uniform price has been fixed, representing an advance of about 50 per cent. on previous quotations. The British market is to be closed to the importation of German screws.

A Fatal Accident.—On p. 96 of our issue for August 16th we published a report of proceedings at a coroner's inquest upon the death of a stonemason who fell off a scaffold at Hanover House, a block of flats in course of erection at St. John's Wood. The Home Office inspector watching the enquiry made some remarks about carelessness that reflected upon the foreman in charge (Mr. Hosken). We wish to remove any such impression. The stated facts clearly indicate to anyone conversant with building operations that any such imputation would be groundless, and we agree with Mr. E. P. Warren, the architect of the work, who is pre-eminently entitled to an opinion, that the remarks of the inspector were quite uncalled for, and in no way justified by the facts of the case. We may mention that Mr. Hosken's carefulness and ability as a foreman are testified by Mr. Oswald Craske, builder, of Chelsea, in whose employ he was for eighteen years.

Newcastle Bricklayers' Strike Ended.—The conference held in Newcastle last week in reference to the local building dispute with the bricklayers resulted not only in a practical settlement of a long-drawn-out strike but established the adoption of the principle of arbitration to prevent future disturbances of the industry. The wages are to be 9½d. per hour; piece-work rules, previously existing, are to be established; the rule limiting apprentices is to be cancelled; and in future disputes a conciliation board of twelve representatives from employers and workmen is to be called together within forty-eight hours. Failing an agreement, a disinterested gentleman of known integrity will be invited to act as umpire and to give his casting vote. On wages the bricklayers have made the same concessions as the masons made at the end of May. The labourers will follow suit, and the plasterers, it is hoped, will fall into line.



HOUSE AT TRISCOMBE, SOMERSET.

(Royal Academy Exhibition, 1905.)

As the house is exposed, the design was kept low. The walls are of cement, rough-casted. The roof is covered with thick slates varying in colour from green to deep orange. The builder was Mr. Henry Pollard, of Bridgwater; the lead glazing and casements were carried out by Messrs. Burt & Potts; and the heating and hot-water supply by Messrs. Crispin, of Bristol.

Correspondence.

Expansion of Concrete Floors.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In reference to the correspondence on this subject in your issues for August 9th and 16th, resulting from an enquiry by "C. W." published on p. 24 of your issue for July 12th, my experience of between thirty and forty years with concrete in many forms is that it does not expand to any appreciable extent in practice. It may do so slightly, perhaps, but this is imperceptible in floors, walls, &c., where ramming or compression cannot be effectually performed. It is not then perfectly homogeneous, and the expansion, if any, simply increases the homogeneity in a minute degree. Concrete compressed in a machine occupies at least 5 per cent. less space than when not compressed. The expansion, if any, apparently ceases when the concrete is set, that is, within forty-eight hours, assuming the cement to be of good quality and seasoned, and the aggregate of a suitable nature; and, no matter how large the area of a floor, one portion will have ceased to expand while another portion is in hand.

Occasionally there appears to be direct evidence of expansion, the brick walls having been disturbed, but this, in every case I have come across, has occurred through the concrete resting on a portion of the wall and the outside portion of the latter having been built up (perhaps 9 ins. in height) for the concrete when soft to stop against. When concrete is in a soft state considerable pressure is exerted laterally (as we know when concrete walls are built between wood encasements) and the brickwork "bulges" where the concrete rests against it.

The expansion and contraction of concrete through changes of temperature is quite another matter, and is now well understood. In my experience reservoirs of concrete—cemented—have never been known to leak when underground and covered, whereas if open they have never been watertight. I well remember one of the latter class that held water perfectly during the summer months, but never during the winter.

An enquiry made of a clerk of works to a large public building brought the following reply, dated May, 1903:—

"In reply to your enquiry I have not found any expansion of concrete floors in any of the buildings, although several have been done now over four years.

"A number of the pavilions are 120ft. long and 26ft. wide, without a break or division wall, the ground floors being 5ft. from the

ground and the upper floors 14ft. above the ground floors. Had there been any expansion it must have shown long before now."

I know of nothing that can be more conclusive than this letter.

I never—except on one occasion to satisfy a client—used fillets round floors, and never remember a genuine case of any bad result from expansion. Mr. Flitton has evidently in mind the system adopted when plaster concrete was in vogue. Obviously where very hot or inferior cement has been used expansion may possibly occur up to two years after the work has been completed, owing to the chemical changes cement undergoes for that period, as Mr. Grant proved by experiments made for the old Metropolitan Board of Works. All this is, however, ancient history, and was fully dealt with many years ago in my book on "Concrete." There is, however, another feature connected with the use of cement that often occurs, namely, the development of cracks in walls built with cement-mortar long after they have been finished. This may be traced to the incompressibility of cement-mortar, the walls being as a result unable to resist the effect of climatic changes. Lime-mortar is more elastic, and is better able to yield sufficiently to avoid these cracks. If the cement is hot, or the proportion of sand to cement is too small, the possibility of cracks is much increased. If concrete floors are in proximity thereto they have to bear the blame; while if there are none, then it is put down to a "settlement." I have known numerous instances of this kind, and it would be useful to know if "C. W.'s" walls were built with cement-mortar. A certain means of judging whether hot cement has been used is that horizontal cracks are usually in evidence at various points, as well as vertical ones.

A correspondent writes: "When will engineers and architects refrain from using that very doubtful concrete aggregate 'coke-breeze'; it has nothing to recommend it, and it is certainly not fireproof." As a matter of fact, it is the coal-dust that is sometimes found in breeze that makes it less fireproof than some other materials; but I am surprised to read that limestone, which in a fire is rapidly converted into carbonate of lime, is the best material for fireproofing. The old rule that "anything that has passed through fire can best resist fire" still holds good in my opinion.* Coke-breeze is, however, a better material than it gets credit for. Messrs.

* Arrangements have been made by the Associated Portland Cement Manufacturers, Ltd., to have the resistance of various aggregates investigated shortly at the London Testing Station, and that should settle the question.—Ed. B.J.

Kirkaldy made a series of experiments for the West Ham Corporation on the comparative strength of brickwork and coke-breeze concrete, with the following result:—A stock brick pier 18 ins. by 18 ins. by 6 ins., built with blue lias lime mortar, crushed under 730 lbs. per sq. inch. A coke-breeze concrete pier of similar size, composed of 1 part of cement to 6 parts of breeze, crushed at 2057 lbs. This is a result which, except on the report of so eminent a firm as Messrs. Kirkaldy & Sons, would be taken probably with a grain of salt.—Yours truly,

THOMAS POTTER.

66, VICTORIA STREET, LONDON, S.W.

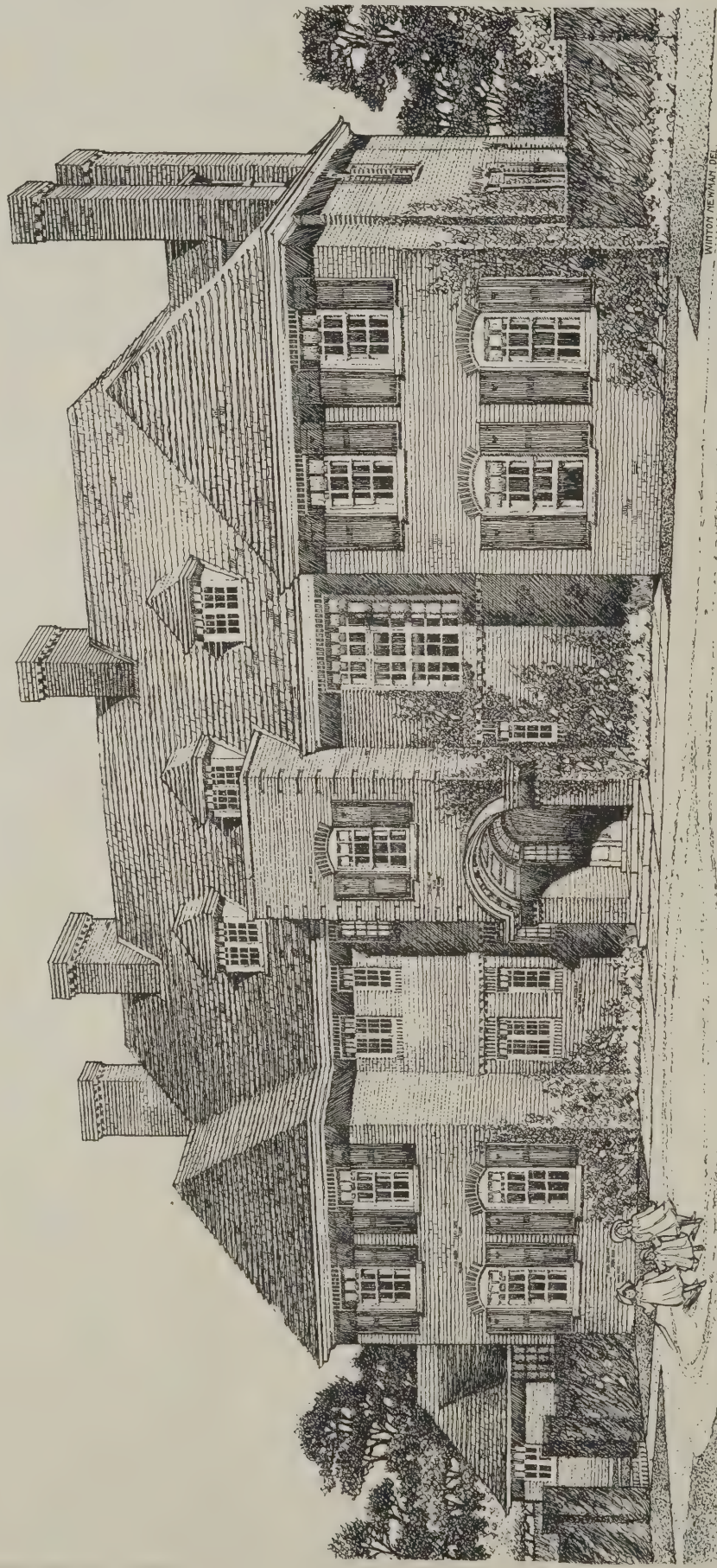
The Mahogany Stair Balustrade, Dunnikier House, Kirkcaldy.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—It might be interesting to know the date of this reputed fine balustrade, which now, unfortunately (according to your issue of August 2nd), appears to be likely to be removed from its original position. Mr. Frederick Litchfield in his excellent work, "The Illustrated History of Furniture" (published by Truslove & Shirley, 143, Oxford Street, W., 1892, price 25s.) puts down the year of the first introduction of mahogany into England as about A.D. 1720. This is the story he tells relative to it (p. 195):—"Mahogany may be said to have come into general use subsequently to 1720, and its introduction is asserted to have been due to the tenacity of purpose of a Dr. Gibbon, whose wife wanted a candle-box, an article of common use at the time. The doctor, who had laid by in the garden of his house in King Street, Covent Garden, some planks sent to him by his brother, a West Indian captain, asking the joiner to use a part of the wood for this purpose; it was found too tough and hard for the tools of the period, but the doctor was not to be thwarted, and insisted on harder-tempered tools being found, and the task completed; the result was the production of a candle-box which was admired by everyone. He then ordered a bureau of the same material, and when it was finished invited his friends to see the new work; amongst others, the Duchess of Buckingham begged a small piece of the precious wood, and it soon became the fashion. On account of its toughness and peculiarity of grain it was capable of treatment impossible with oak, and the high polish it took by oil and rubbing (not French polish, a later invention) caused it to come into great request. The term 'putting one's knees under a friend's mahogany' probably dates from about this time."—Yours truly,

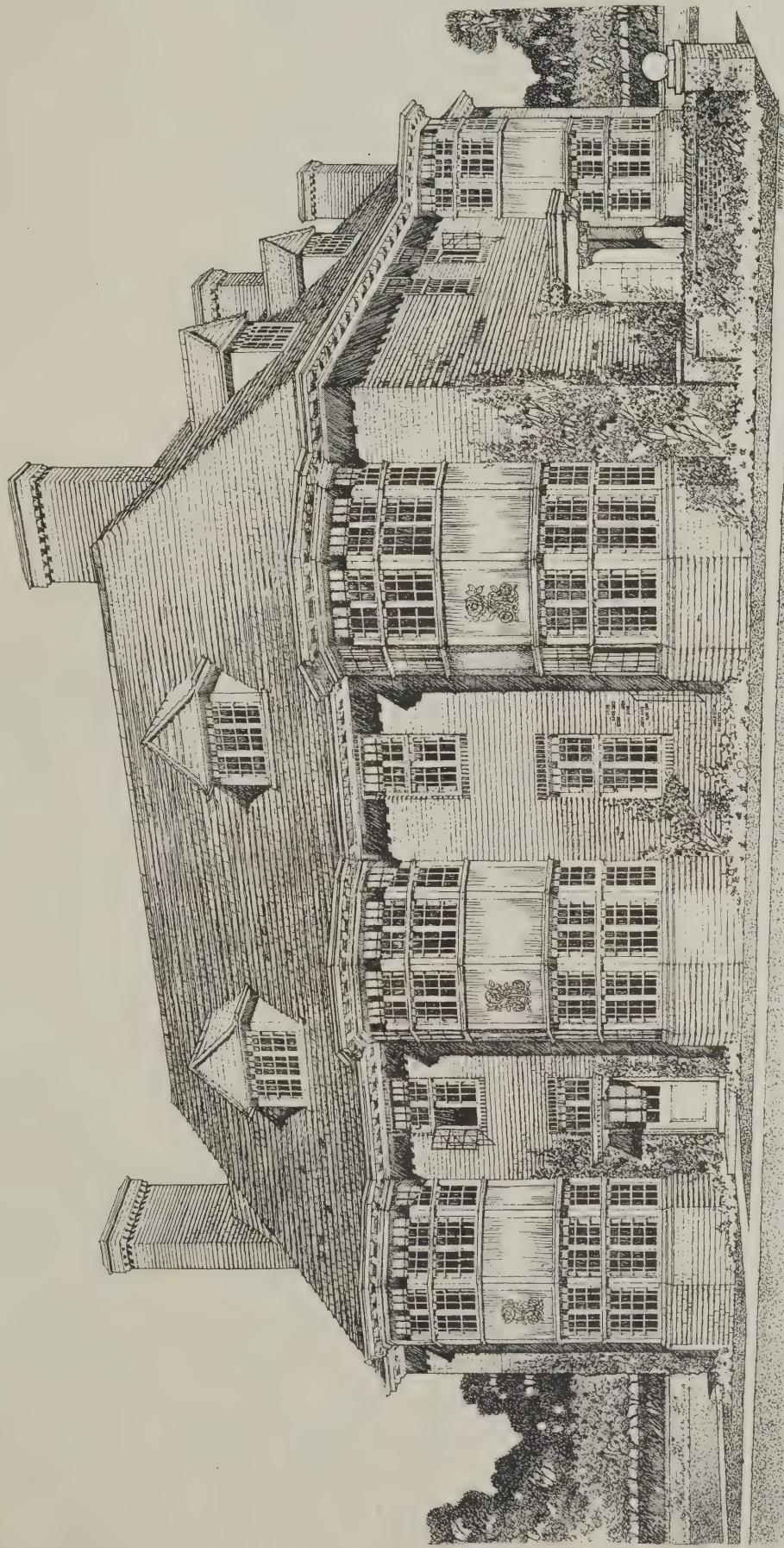
FAIR PARK, EXETER. HARRY HEMS.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



ERNEST NEWTON ARCHT

HOUSE AT BICKLEY, KENT. (Royal Academy Exhibition, 1905.)



ERNEST NEWTON. ARCHT

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



Photo: E. Dockree.

NEW BUSINESS PREMISES, HIGH HOLBORN, LONDON. H. PERCY ADAMS, F.R.I.B.A., ARCHITECT.

The basement and ground floors are built of Grey Royal granite, and the building above is faced with Portland stone. The turret is covered with lead, and the roofs with Westmoreland slates. The carving was done by M. Aumonier from sketches supplied by the architect. The internal joinery-work is chiefly teak and mahogany, the staircase being of teak. The ground floor consists of shops and bank or insurance premises, with basement rooms in connection. The four upper floors comprise suites of offices entered by way of a teak-panelled hall and lift from Southampton Street. The works were carried out by Messrs. Prestige & Co., of Pimlico.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Price of Bricks at the Cheap Cottages Exhibition.

WORKINGTON.—J. S. writes: "At what price per thousand are the bricks calculated in the construction of the cottage designed by Mr. Percy B. Houfton for Messrs. Green Brothers, and illustrated on p. 75 of your issue for August 9th?"

Mr. Houfton replies that Messrs. Green Brothers inform him that the bricks used in the cottage erected by them were local Arlesley make, and cost 20s. per thousand delivered on the site. The total number used was 20,900.

Sketching at Kirby Hall.

OLDHAM.—REGULAR READER writes: "To whom should I apply for permission to sketch at Kirby Hall, Northamptonshire?"

Permission to sketch at Kirby Hall, Deene, Wansford, may be obtained from Mr. J. Rooke, Estate Office, Weldon Grange, Corley, Kettering. H. M.

Places suitable for a Sketching Tour.

HESSLE.—O. H. W. H. writes: "I am desirous of spending a week or ten days in a neighbourhood where there are good examples of English Renaissance work for sketching, and should be obliged by any suggestions."

As you have only a week or ten days for sketching you had better go to some place where a large number of historic buildings are to be found close together, in order that no time may be wasted in travelling from one place to another. Such places are Cambridge and Oxford and, before all places, London. If you prefer a little travelling on your sketching expedition you will find Lancashire as rich as any county in good examples of Renaissance architecture.

H. Y. M.

Buildings to Measure in Lancashire and Yorkshire.

PRESTON.—ENQUIRER writes: "Please name any Renaissance buildings in Lancashire or Yorkshire suitable for the measured drawings of the R.I.B.A. final."

In Yorkshire perhaps the finest example of Renaissance work is Burton Agnes, which was commenced in the year 1603 and was added to in 1628 by Inigo Jones. Other examples in Yorkshire are Burton Constable, 10 miles north-east of Hull, built at different periods in the reigns of Henry VIII., James I. and Charles I.; Howsham Hall (Elizabethan); Slingby, built in 1603 and now in a ruined condition; Ripley Castle; Temple Newsom (Charles I.); Bowling Hall (Elizabethan, with towers of an earlier period); Woodsome Hall (Henry VIII., refronted seventeenth century); Ledstone Hall (Jacobean); Castle Howard and Buncombe Park, by Vanbrugh; Harewood; Wentworth Woodhouse; Nostel Priory; Snape (Perpendicular and Elizabethan); Mount Grace Priory; Ingleby Manor. —Lancashire is very rich in Renaissance work, of which the finest examples are Clegg Hall, Kenyon Peel, 1631; Speke Hall, half-timber; Hoghton Tower; Astley Hall. Some fine examples of domestic work are to be found around Manchester. Good work is to be seen at all the following places:—Ashton under-Lyne, Rochdale, Buckley Hall,

Chadderton Hall, Healey Hall, Wolstenholme Hall, Chadwick Hall, Extwistle Hall, Emmott Hall, Smithills Hall, Hall-i'-th'-Wood, Pleasington Hall, Gawthorpe, Nuttall Hall, Brandleham Hall, Samlesbury Hall, Clitheroe, Mearley Hall, Horrocksford Hall, Waddington Hall, Lea Hall, Ashton Hall, Borwick Hall, Capernwray Hall, Holket Hall, Swathmore Hall, Bendsea Hall, Croston Hall, Wigan, Haig Hall, Ince, Wardsley Hall, Kenpool Hall, Wansley Hall, Monk's Hall, old houses on the banks of the Mersey, Shaw Hall, Hale Hall, Bewsey Hall, Newton Old Hall, Bold Hall. H. Y. M.

"Sirapite."

X. writes: "Who are the makers of 'Sirapite'?"

The Gypsum Mines, Ltd., Mountfield, Robertsbridge, Sussex.

R.I.B.A. Testimonies of Study.

STUDENT writes: "Will the R.I.B.A. allow the testimonies of study of measured work for the final examination to be coloured up so as to distinguish the various materials?"

Yes; it is left to the discretion of candidates.

The Development of Building Estates.

PLYMOUTH.—REGULAR READER writes: "Please name a standard work on the development of building estates, including necessary sewerage, &c."

"Building Estates," by F. Maitland (price 2s. post free from our offices).

School Board Regulations.

HALIFAX.—INCOGNITUS writes: "Is there any schedule of conditions or special by-laws for the erection of elementary schools published under the new Education Act; or do the same requirements hold good as under the old School Boards before the introduction of the new Act? Where could I get a copy of such conditions?"

The schedule for school planning is published by Messrs. Eyre & Spottiswoode, 9, East Harding Street, E.C., price 2d.

Liability for Damage to Tiles.

X. X. write: "Makers consigned by Great Western Railway a truck of 1,520 tiles and ridges, of which 299 were admitted as being broken when tendered to us by the Great Northern. Senders say the tiles were packed in the usual manner, and the Great Western did not question this, but refused to carry unless senders signed a risk note, on the ground that they only took such goods at owners' risk, and on this both railway companies now base their refusal to pay claim. Although gross misconduct is obvious it cannot be proved and located. Senders say they compulsorily signed the note on our behalf (but we gave no authority) or tiles could not have left the station. Does a risk note absolve railway companies from liability when such a large proportion of the goods is broken? What course do you advise us to take?"

We cannot see that there has been any gross misconduct on the part of the railway company. The goods were packed by the senders and unpacked by you, and they ought to have been securely packed so as to stand the buffeting that necessarily occurs on a railway journey. If packed in the usual manner we can only say that was the wrong manner. However, the signing of a risk note relieves the companies of liability. An order for such goods should always require the senders to deliver the goods and take all risk, and if they paid the carriage in this case they are clearly liable for the damage. Considering that the goods were inadequately packed and that you were asked to give authority for the signature of the risk note, we think the senders would be held responsible.

THE BUILDING TRADES IN JULY.

THE Board of Trade reports that employment in the building trades during July continued dull and showed little change compared with June. It was worse than a year ago.

The percentage of unemployed trade-union carpenters and joiners was 6.5, as compared with 6.7 in June and 5.7 a year ago. With plumbers employment on the whole was much the same as in June. In England it was bad; in Scotland moderate. The percentage of unemployed trade-union plumbers was 10.1 at the end of July, as compared with 10.2 at the end of June and 10.5 a year ago.

With bricklayers, masons and plasterers employment generally was dull, and worse than a year ago. With slaters it was much the same as in June, being bad in England but fairly good in Scotland. It was worse than a year ago in England, but rather better in Scotland. Employment with painters was slack, and worse than a year ago. With builders' labourers it was dull on the whole.

The following is a summary of the reports received from all sources as to the state of employment in the various districts:—

London.—Employment, though still slack, was better than in June. It was, however, worse than a year ago. Returns received from 56 employers show that in the last week of July they paid wages to 11,091 workpeople of all classes, as compared with 10,899 in June and 13,065 in July, 1904.

Northern Counties.—In the Newcastle and Sunderland districts employment was affected by disputes. In the Tees and Hartlepool district employment generally was only moderate, and showed little change on the whole compared with June.

Lancashire.—At Liverpool and Manchester employment continued dull. At Bolton it was fairly active, and better than during June. At Oldham it was moderate. At Blackburn employment on the whole was moderate, and about the same in June.

Yorkshire.—Employment generally was slack, and showed no improvement as compared with June.

Midlands.—Employment generally was dull, and much the same as in June. At Birmingham, however, a slight improvement as compared with June was reported by the carpenters and joiners and plasterers, as also by the plumbers and plasterers at Leicester. At Coventry, Walsall and Burslem employment was fair.

Eastern Counties.—Employment generally continued slack, and was slightly worse than during June.

Southern and South-Western Counties.—Employment continued dull generally, and there was a further falling off in certain branches.

Wales and Monmouthshire.—Little change was reported compared with June, and employment generally continued slack.

Scotland.—In Glasgow employment generally was quiet, but a little better than in June. In Edinburgh employment has shown some improvement since the termination of the joiners' dispute. In Dundee and Aberdeen employment was dull; the improvement with joiners in June was not maintained.

Ireland.—In Dublin the improvement in June was maintained, and employment was moderate. In Belfast employment was moderate on the whole. In Cork it was much the same as during June.

Mr. F. R. Farrow, of Messrs. Colson, Farrow and Nisbett, architects and surveyors, 29, New Bridge Street, Ludgate Circus, E.C., informs us that his telephone number has been altered to "2328 Holborn."

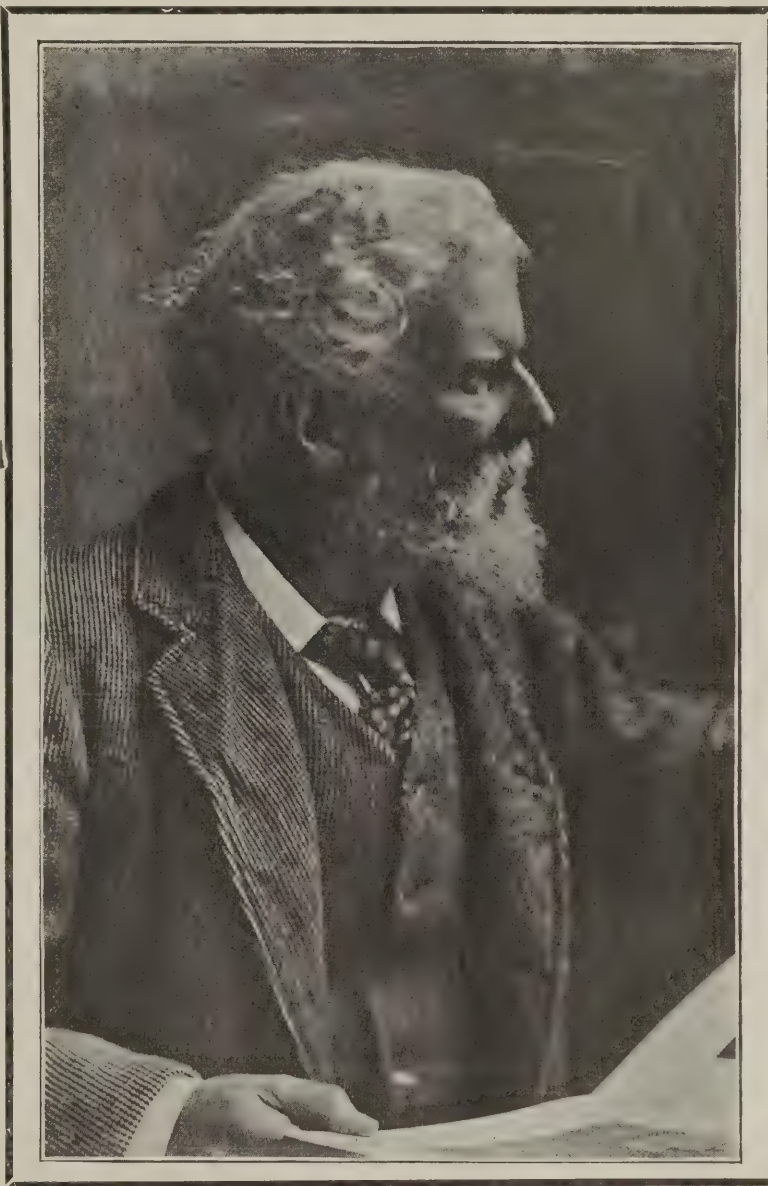
THE LATE MR. ALFRED
WATERHOUSE, R.A., F.R.I.B.A.

MR. ALFRED WATERHOUSE, R.A., LL.D., who died on Tuesday last week at Yattendon, Berkshire, was born at Liverpool on July 19th, 1830. His father (also named Alfred Waterhouse) married Mary, daughter of Paul Bevan, and as both families (the Waterhouses and the Bevas) belonged to the Society of Friends Mr. Waterhouse was educated at the Quaker School, Grove House, Tottenham. His earliest architectural training was received in the office of Richard Lane, in Manchester, and it was in that city that he first began practice, at the close of 1853, after making an extensive tour in France and Italy during the same year. Mr. Waterhouse's wish as a boy had been to follow the art of painting, and the choice of architecture had been a compromise on the part of his father between Bohemia and commerce. The pictorial instinct was strong in the young student, and the architectural sketches which were the product of this Continental tour are very far from being the ordinary educational studies of a tyro. It was in 1859 that the competition for the important assize courts at Manchester gave Mr. Waterhouse the opportunity of exhibiting his powers of dealing with a complicated problem and of showing his colours in the matter of style. In his design, which was selected, he at once declared himself not only one of the Gothic champions, but also a master of the art of planning. About nine years later came his next great Manchester success, the winning of the competition for the town hall; and though he had as early as 1865 transferred his practice to London, Manchester continued throughout his career to give him opportunities of work. Among them may be mentioned the Owens College (1870-1901), the Salford Gaol, St. Mary's Hospital and the premises of the National Provincial Bank of England (1888), the Refuge Assurance Co. (1891) and the Prudential Assurance Co. Liverpool also has a fair share of his work in such important buildings as the University College, the London and North-Western Hotel, the Seamen's Orphanage, the Royal Infirmary, the offices of the Pearl Assurance Co., and the Turner Memorial Home.

Mr. Waterhouse's work in London may be said to have opened with the New University Club in St. James's, a bold application of Gothic art to an unusual purpose. Mr. Waterhouse came, it is said, very near to success in the great competition for the Royal Courts of Justice, and it was a significant fact that at the close of that remarkable process of selection the Government, in quasi-acknowledgment of a certain claim on the part of two of the unsuccessful competitors, Waterhouse and Barry, announced that they entrusted the latter with the alterations at the National Gallery and the former with the building of the National History Museum at South Kensington. As a matter of fact, there was no real compensation to Mr. Waterhouse in this arrangement, as he had

already been commissioned to erect the museum, which in its completed state may be regarded as a pioneer attempt in the use of terra-cotta on a large scale and as a vigorous essay in the free adaptation of Romanesque art to modern needs.

It was comparatively early in his career (1867 and 1868) that Mr. Waterhouse was entrusted with his first collegiate work—the rebuilding of large portions of Balliol College, Oxford, and Caius College, Cambridge. In the latter design he attempted a Renaissance *motif*, which, though it does a respectful homage to the immediately surrounding buildings, is hardly as successful as his later Renaissance and Classical designs, such as the National Liberal Club (1885).



ALFRED WATERHOUSE, R.A., F.R.I.B.A.

Other work of Mr. Waterhouse's is to be seen at Cambridge in Pembroke College (1871), Giron (1872), and also in the small bank for Messrs. Foster. Several other banks came under his care, notably Brown's Bank, Leeds (now Lloyd's) and the National Provincial Bank in Piccadilly. For the Victoria University he erected not only the already mentioned colleges at Manchester and Liverpool, but also the large range of buildings known as the Yorkshire College at Leeds. Of his schools, the chief are St. Paul's School, Hammersmith (1881), St. Margaret's School, Bushey (1895), and the Central Technical Institution, South Kensington (1881).

In 1870 Mr. Waterhouse was first engaged

by the late Duke (then Marquis) of Westminster in the alteration of Eaton Hall, Chester, a project which eventually developed into a complete rebuilding and gave the architect an exceptional opportunity that led to a very celebrated achievement. Other domestic work of importance was Iwerne Minster (1877) for Lord Wolverton; the rebuilding of Heythrop (1871), a severely Classic house, for Mr. Albert Brassey; Abinger Hall for Lord Farrer; Hutton Hall for Sir Joseph Pease; Springfield, Maidstone, for Mr. R. J. Balston; Buckhold, Berks, for Dr. Watney; Steventon, Hants for Mr. Harris; and a villa at Cannes for Mr. Grant Morris.

For the Prudential Assurance Co. Mr. Waterhouse designed not merely the premises in Holborn, which date from 1876 to 1901, but branch offices in various principal towns, such as Edinburgh, Glasgow, Newcastle, Nottingham, Leeds, Bradford, Dundee, Hull and Birmingham.

His principal hospital work is that for the University College Hospital in Gower Street. The Nottingham General Hospital (additions) and the Alexandra Hospital at Rhyl deserve mention. Mr. Waterhouse designed two Congregational places of worship—the Lyndhurst Road Chapel at Hampstead and the Weighhouse Chapel, Grosvenor Square. His best church is that of St. Elizabeth Reddish. It remains to mention two more buildings in London—the Surveyors' Institution in Great George Street and the Jenner Institute of Preventive Medicine at Chelsea. During the last twenty years his services were in frequent request as assessor in architectural competitions.

From 1888 to 1891 Mr. Waterhouse was president of the Royal Institute of British Architects, of which he had been a member since 1861. He received the Royal Gold Medal of that body in 1878, became an Associate of the Royal Academy in the same year and a full R.A. in 1885. Many foreign Academies honoured him with their diplomas, notably those of Vienna (1869), Brussels (1886), Antwerp (1887), Milan (1888) and Berlin (1889). As early as 1867 he acquired a Grand Prix at the Paris Exhibition, followed by a "Rappel" in 1878. In 1893 he was a "Membre correspondant de l'Institut de France." In 1898 he was one of the international jurors in the competition for rebuilding the west front of Milan Cathedral; in 1890 he sat on the Westminster Abbey (Burials) Commission; and in 1895 he received from the Victoria University the honorary degree of LL.D.

Mr. Waterhouse married in 1850 Elizabeth, daughter of John Hodgkin, barrister-at-law, and had five children, four of whom survive. His eldest son, Mr. Paul Waterhouse, was in partnership with him since 1891.

A great part of the leisure of Mr. Waterhouse's life was devoted to landscape painting in water-colour, and latterly in oils. Three times he built himself a house—first at Manchester (Barcombe Cottage, Fallowfield), next at Reading (Fox Hill, Whiteknights Park), and finally at Yattendon, Berkshire, where he died.

Commenting on his work the "Times" says: "It would be affectation to ignore the fact that among the younger school of architects and artists Mr. Waterhouse's architecture was not regarded with favour or sympathy. . . . As far as his earlier Gothic buildings are concerned, this depreciation is to a great extent the result of the change of architectural fashion. When the Manchester Assizes Courts and the town hall were built their architect was regarded as an artistic leader. Now that the mediæval revival has run out, these works are regarded with indifference—a change of front which is hardly fair to him. As regards his later works, unconnected with the Gothic Revival, their prevalent defect is, no doubt, a florid character of detail and a want of repose. His University buildings, those at Caius College especially, are not in harmony with the *genius loci*. Perhaps he never quite got over the influence of a Manchester training; for Manchester architecture, like Manchester politics, had at one time its own special characteristics. But the prejudice against his architecture has been carried, in what may be called "æsthetic" circles, to an absurd and unreasoning extent. It is criticized by people who could not themselves have planned Mr. Waterhouse's buildings, or even, perhaps, understood the points of his planning. Whatever his defects of taste, a man who had such capacity and readiness in planning and designing buildings on a large scale, and who seemed able to grasp and deal with every practical problem in building as soon as it was presented to him, was essentially a great architect. . . . Personally Mr. Waterhouse was one of the most genial and attractive of men. Good health, cheerfulness and good nature seemed expressed in his appearance and manner, and probably of few men could it be more truly said that he was liked by all who knew him. Even those who did not like his architecture loved the man. . . ."

LIBRARY PLANNING.

MR. HENRY T. HARE, F.R.I.B.A., in a paper read before the Library Association at Cambridge last week said that he was invited to deal more particularly with the question of the design and planning of the buildings for public-library purposes, and he might say that it was by no means easy to meet all the requirements in a perfectly satisfactory manner. The leading requirements of the building were (1) ample space or area in all parts; (2) abundance of light, air and ventilation; (3) facility for supervision and working. He suggested that the rule-of-thumb standard of floor space per reader was generally inadequate. Almost all their public libraries were much too closely packed in their arrangement for the comfort, health and free circulation of readers.

Mr. F. J. Burgoyne (librarian of Lambeth) thought that during the past few years there had been great developments in the art of library planning. Since Mr. Carnegie's benefactions had been the means of exciting the emulation of architects in all parts of this country and America, the results showed that many plans had been evolved well worthy of consideration. No model plan could be the best for all, with the varieties of size, area, shape and position of sites. Various statistics were given on which to base plans of any given library. Before the building was planned architects should obtain from the librarian a clear idea as to the methods of work to be employed in it. He hoped that his remarks would tend to obviate the fatal error so often made in purchasing ground too small for wants and in erecting buildings incapable of extension.

SOCIALISM AND THE ARCHITECT.

By Charles Henry Israels.

THE industrial machinery of the twentieth century demands of each individual the performance of the task for which he is best equipped. The tendency of the age is towards specialized and co-operative effort. Each department has its definite area of activity, and co-operation itself is obtained through specialists in executive management. Most of the forces of industry are instinctively adjusting themselves to the new conditions. They have selected their own positions in the movement. A few have refused to recognize the tendency: the procession has swept by, and being unable to carry them along has ruthlessly bent them in the direction of progress—where they either remain stationary or are forced into positions for which their workers are ill-equipped and their original destiny perverted.

The Architect a Business Man.

The complex building trades have responded in the main to this tendency—all but the architect. He is reactionary. Architecture in past ages was an art. Its practitioners were recognized as artists. The architect still proclaims himself an artist, but in a large measure he has become a business man; and the practice of architecture has become a business. A list of the most successful practitioners in the United States would contain the names of an undue proportion of men who owe their success to their abilities as organizers, promoters and business men rather than as designers, as architects.

The architect may deplore the fact; but he is himself responsible. He has not readjusted his work in order to cope successfully with the conditions of the times. He has not specialized in the one field in which his training makes him supreme. He has opposed this specialization. He has been stubborn. Other forces have bent him—and in his own speciality he stands still. His progress has been in directions where others can give better results.

His energies have been so much given to maintaining his business footing that he has neglected his art. Under these conditions the practice of architecture must remain a business, artistically uncreative and stagnant.

The industrial world looks to the architect as the man best fitted technically to assemble the complex materials of a modern structure into a harmonious whole. His success or failure is gauged by the results obtained in his finished product. To be thoroughly successful this product must show the highest efficiency in all its parts and at the same time be aesthetically satisfying. When the architect has arrived at this result he has accomplished his mission.

Modern Methods.

Under the pressure and specialization of modern practice he is not achieving the results expected of him. His methods are not harmonious. He is not maintaining the proper balance between the component parts of his work. His energies are diverted from their proper channels. He is devoting an undue proportion of his talents to business, engineering and mechanics, and the æsthetic side of his work for which he is best fitted is being neglected.

The architect foolishly believes that this programme is necessary in order to maintain his position as an artist. In reality it is having the directly contrary effect. The only way in which the architect can regain his position in the arts is by recognizing the modern tendency of industry, and by being content to perform only that portion of the work in connection with building for which he is adequately equipped. The best results will be obtained if the architect recognizes

this evolution and readjusts his work and his duties accordingly; but with or without his consent the change will come, and architecture will again become an art in spite of him.

A Socialistic Tendency.

It is not my purpose to argue for or against this industrial evolution; but no unprejudiced observer can deny its tendency. Rightly or wrongly, all signs point one way. This way is socialistic: but the men who are mainly responsible for the tendency are not "doctrinaires." They are the "captains of industry." They would be the last to admit that they are the forerunners of the co-operative commonwealth, and yet to the socialist they are the living proof of his doctrine.

The formation of every trust, every trade and labour union, every society of professional men, and every combination of employers tells but one story. These combinations are in turn subdividing, each subdivision working in its own speciality and having its own organization, but maintaining its affiliation with a central body.

The age of individualism is fast becoming a memory. Men are combining not for individual but for co-operative effort. The conduct of the business of architecture follows this socialistic tendency as to organization but not as to specialization. The work is specialized but within itself. It is co-operative; but the technical and strictly architectural speciality and the executive speciality are both centred in the architect. The executive speciality requires constant and prompt attention. Its demands must be instantly met. Its powers cannot be delegated to others. The architectural speciality needs quiet and tranquillity, and under the pressure of modern business it becomes physically impossible for one man to attend to both. The result is obvious. The tranquil state is not reached. The architect devotes his energies to his imperative duties.

The Architect of To-day.

The busy architect of to-day does not draw, he does not design; the purely commercial interests of his work occupy all his time. The client usually demands careful and personal supervision of his finances as paramount to any other consideration, and at most the busy man finds it barely possible to make the roughest kind of sketches which he turns over to his draughtsman for further elucidation. When the design is finished he signs his name as architect—but the individual touch of the artist is usually not there, and, if there, it is only the voice of the architect but the hand of the draughtsman.

The modern architect's office is one vast machine, in which the work is subdivided into many departments. Architectural firms have grown out of this condition, and their formation is generally consequent upon the necessity of making combinations of specialists to the end that the firm may be able to handle the complex problem of modern construction. One man is the designer, the second may be the engineer, and the third the business man. Even then they cannot cover the whole field, for their draughtsmen, too, have become specialists. In some cases a draughtsman becomes a managing clerk; others are designers; some simply trace, others attend to construction. A well-organized office has a specification writer and specialists in heating and electricity, as well as outside superintendents and book-keepers. In fact, the business of a large firm with an extensive practice is as complicated in its machinery as a department, store, but with this difference, that the department store has a manager whose sole business it is to manage. The manager has a specialist under him in each department, and he makes no pretense to special knowledge except in the executive department. If the architect is satisfied that architecture should remain a

business, this method is logical. If he persists in proclaiming himself an artist he should give up the management of this complex machinery to others trained for the purpose.

The New Conditions.

Under the conditions which obtained in the past the architect could fairly assume that he was competent to grapple with the business problems incident to his work and still maintain the proper relation between his business and his art. His training in the schools still teaches him that he should be considered first and foremost as an artist—and in these schools the proper balance is maintained between the strictly architectural and the business side of his profession. The men responsible for the curriculum realize that an attempt to teach modern business methods would carry it far beyond the domain of academic training. They assume for the purpose of this training that old conditions still obtain. Under these conditions it was possible for the architect to be the master-builder and to assume that he was an expert in all the building crafts.

To-day the architect cannot honestly assume this position. Construction has become too complicated. His knowledge must be superficial, and in his effort to assume a preponderance of exact information in all of the works over which he presides, he finds that he is outstripped by the experts working under him. If he continues to attempt to hold on to the powers and authority that he has exercised in the past there is no hope for the architecture of the future.

He cannot produce his work as a commercial commodity and at the same time be an artist. The dealers in this commercial commodity will always need the artist. They realize that beauty has a commercial value, and in no other age has the average man been so willing to expend his wealth for the purely beautiful. There have been popes, kings and emperors who have been patrons of the arts in a larger measure than any individual of to-day. But now the people are interested. They may be interested because it pays—but they are interested. The architect cannot satisfy that interest; he cannot give the best he has in him while his time is consumed by the multiplicity of details which modern practice demands of him.

American Work.

The result of this tenacious holding on to an obsolete programme is visible in much modern work, and particularly in American work, where the strain is greatest. The American nation has made no advance whatever towards the creation of a national style. When it wishes to build a beautiful tower a Spanish monument is copied; when a modern clubhouse is to be erected the design of an Italian palace is enlarged and fitted to the new conditions. American architects have worked Vignola to death—but they have not solved the modern problem. What encouragement is there to the younger workers when they see the *doyens* of their profession, the men who are accepted as types of successful practitioners, willing to rest their reputations upon good copies of ancient works?

These old and beautiful examples of the art of the past were the results of the application of an artistic spirit to the needs of the time. They were the outgrowth of a system which left the architect time to give his work creative study. They answered the problem. The architecture of to-day under pressure of the industrial system has degenerated into copying. It is good architecture only as far as the copying is judicious.

On the business side of his work the architect has been trained to believe that he would have a free hand. He actually finds himself bound by hard and fast limitations. He expected to be employed by an indi-

vidual—his client is more often a firm or corporation. He was to seek the co-operation of many individuals, who in turn would employ the units which would cause his design to become a concrete thing. He actually finds a few corporate interests, with whom he must deal under definite conditions, which in turn deal with other combinations of men through trade organizations and labour unions. Circumstances may make it advisable that he should avoid the larger corporations in seeking to have his client's work performed—but even then he finds his liberty of action hemmed in on all sides by combinations of both employer and employee. He can carry out no work for his client unless he deals with these combinations. Under the simpler constructive methods of the past the architect dealt with a few trades; he now finds that he must deal with hundreds; and each unit is simply a part of an organization which refuses to do business except under co-operative conditions.

Building Corporations.

By far the largest number of building operations of importance have as their controlling interests corporations formed for the purposes of building or holding real estate, or professional real estate operators who are thoroughly trained in finance. They know to a nicety just what their building properly demands. They have figured out the rentals and running expenses minutely, and they are perfectly familiar with the commercial value of their product and of all of its component parts. They need the architect to solve successfully the commercial problem on the basis of definite data and to inject into the scheme the utmost amount of beauty consistent with its solution. These corporations cater to the private owner as well as the business firm, and palatial dwellings are now procurable by the home-seeker ready made.

In the past a wealthy client would have carefully considered every detail of the plan of his new home—his entire family would have been consulted at every step. To-day he can find dwellings offered for sale ready for occupancy in fashionable neighbourhoods, thoroughly suited to his requirements, constructed with due regard for the most fastidious taste, and containing every possible mechanical appliance known to modern construction.

The heads of the corporations who control these large operations have absolutely no need of the architect in the financial management incident to their schemes. Once having the technical data complete in the form of drawings and specifications, these men, skilled in finance, are infinitely better equipped to consummate monetary deals than the architect, provided that no changes in construction or design are made without the architect's approval, where he alone is in a position to judge of the limitations of any portion of the work.

The changes in the methods of building have made these corporations an indispensable part of the modern business system.

In order to meet the commercial demand of the age time is an essential. One year's loss of rentals frequently means financial disaster. Attempts are made, wherever possible, to construct buildings between rental seasons; and whereas under the older methods it was generally sufficient for the client to engage the architect at a time almost co-incidental with the construction of his building, in many cases the architect is now called in months before the property upon which the improvement is to be made is even purchased. In fact, the services of the architect are essential at the very inception of the scheme as a business venture. The interested parties must have a definite statement of the possibilities of the land placed before them prior to their decision to proceed.

Economical Building.

There are but two ways open in our large centres of population by which a finished building can be produced in a sufficiently economical manner to compete successfully with its rivals. Both of these methods involve using the forces of co-operation to the fullest extent to which they have been carried in practical everyday methods. The economy of one method over the other is purely a question of the importance of time. One is to deal directly with the great building corporations, with their complicated machinery well regulated and in running order. The other is to form a temporary corporation for the particular project, which, although saving large sums of money, must necessarily involve slower methods due to lack of experience.

The method having been decided upon, the business problem thus presented to the modern architect can be solved only in one of these two ways; both centering around the corporation and leading in the same direction, but one starting from a more progressive stage than the other. The old method of calling for competitive tenders from four or five contractors, who would in turn farm out the work to many sub-contractors, is no longer an economical success.

There is no middle course between these corporation methods, and the sharp competition of modern industry has brought about a tendency to eliminate a portion of the competitive system itself so as to save the profit of the middleman.

The modern structure has also become specialized, like all other products of modern industry. In the preparation of the preliminary scheme for a new project the architect frequently finds a large amount of special knowledge necessary, for which he must consult other parties. If it is an office building, a block of flats or a hotel he must familiarize himself thoroughly with local rental conditions—information which can be obtained only from a specialist in the neighbourhood in which the building is to be erected. If a private dwelling, he must know the habits of the family for which he builds; and if a factory or business premises, complete familiarity with the methods of the particular business or manufacture is absolutely essential to success. The impossibility of grasping all of this knowledge is recognized in the trend of modern practice. Men have become experts in theatres, flats, interior decorations, breweries, mills and other classes of buildings, and our large cities have architects on their lists who rarely go outside of their particular specialty and who frequently act in a consulting capacity to the decreasing number of general practitioners.

Construction.

The exacting demands made upon the modern architect are the natural consequences of the complication due to methods of construction. Nowhere is this more apparent than in the fourteenth edition of "Kidder's Architects and Builders' Pocket-Book," where, in explanation of the enlarged size of the new volume, the author states that "at the time the first edition was issued architectural engineering had not been used in its present application, and the term 'structural engineering,' when used, referred almost exclusively to bridge work."

"To-day structural and architectural engineers are concerned almost exclusively with building construction, and their work is more closely allied to that of the architect than to that of the civil engineer; hence the author has had in mind the needs of the structural engineer and draughtsman, as well as those of the architect and builder, and the book should be of nearly equal value to both."

These modern methods of construction



demand of the architect an amount of exact technical service far in excess of that required of him under former conditions. The corporation must have much more exact preparation than the private client required, as it usually demands that all of the material be prepared, fitted and stored before actual construction is started on the site.

More Drawings Required.

...This system has multiplied and concentrated certain services required from the architect many times. Before the first spade of earth is turned he has frequently worked many months in carefully preparing the drawings and specifications of every detail, so that all portions of the work may be started in the various shops at the appointed time.

High taxes and high-priced property demand that each day shall count. Co-operation and specialization have caused the actual output of drawings required from the architect to be increased manifold. Formerly about four or five sets of scale drawings were prepared, and a similar

number of general specifications prior to the work being started. All the details of construction were made as the work proceeded. To-day the architect is expected to reproduce his scale drawings thirty and forty times, and to divide the specifications with the ultimate amount and minutiae, separating them for the various trades, so that some thirty specifications may become necessary, besides the frequent reproduction of all details, prepared far in advance of even the beginning of actual construction. The securing of low tenders to perform the various parts of the work is ensured thereby, and the middleman whose habit it was to guess at the cost of some intricate piece of detail finds that he and his guess are not wanted. The manufacturer of the commodity to be supplied is satisfied with nothing but an accurate full-sized drawing. Wherever these details include the work of several contractors copies must be distributed to the various interested parties as often as the work of each contractor is shown thereon.

Superintendence.

The system of dealing with a large number of workers and having the material completely prepared beforehand requires much more accurate and continuous superintendence than was formerly needed, much more thorough inspection than can be obtained by the occasional visit which the architect is supposed to give. Superintendence as defined in the schedule of the American Institute of Architects is totally inadequate. In fact, to secure proper results it must be continuous, and this is so keenly realized that the clerk of the works has become the rule rather than the exception on all large operations.

Trades-Unionism among Architects.

The architect recognizes the encroachment of his business upon his art; but he has not moved a finger to protect the position which he claims to value. His efforts are purely for business protection. He recognizes the co-operative tendency in his professional association, but mainly for the purpose of upholding professional fees and regulating practice. In England and the United States the Institute of Architects performs the same function as a trades-union. It attempts to level the compensation at least not below the minimum wage, but it is not as altruistic as the trades-union, as the schedule provided is for minimum compensation and its power over its members is not as great. The Institute has set a precedent, but it is not a positive force. In other respects in his professional association the architect refuses to admit that he must change his position, and combats all efforts by others to make the change.

Full Control for the Architect.

The National Convention of the American Institute of Architects, held in Cleveland last year, promulgated the new doctrine that it was unprofessional for an architect to assume to design work without having complete control of its construction. The Institute refused to recognize that under modern methods this supervision should be within limits which would allow the designer to devote the proper proportion of his time to the artistic creation of his design.

Registration Opposed.

Legal enactments in several States requiring the architect to secure a licence have recognized the increased technical responsibilities placed upon the modern practitioner, but these acts have been frequently opposed by the leaders in this most influential of professional associations on the ground that architects were artists and that art could not have its fullest development under legal restrictions. Paradoxically, this same influence has resisted the attempt of the Government to remove some of the technical and business burdens, presumably upon the ground that fees would be reduced accordingly. The logical position would have been to accept the proposition, but to insist that the fees now paid should not be reduced in view of the much larger service required under modern methods.

The Architect is the General of Division.

While the architect is wondering what is to be done—bemoaning his dethronement from the position which he formerly occupied in the arts—his status is being fixed by the building corporation, at the head of which is an executive specialist eager to obtain the best results from each one of the component parts of the great machinery under his control. These great corporations—these department stores of the building industry—are fixing the architect's status anew; and although the process may seem harsh to the profession, this tendency will ultimately cause the architect to be again recognized as an artist. The executive specialist knows the intricacies of building. He realizes keenly just where the architect is an indispensable part of his programme. He confines the

architect to his specialty just as he confines his business and financial managers to theirs. In a supervisory capacity he requires the architect's service only to a limited extent. The executive head of the great corporation is the commander-in-chief; the architect is the general of division—the technical and artistic division and in this division the architect has his engineering, sanitary and electrical experts, all responsible to the commander through the architect. In the details of their specialty they are supreme, provided they do not encroach upon the limitations of the other specialists or interfere with the general scheme.

It is the architect's duty to keep each specialist within his limitations, and the architect himself must bow to the same inexorable laws. His principal value in the realm of supervision is as an advisor. In the complicated construction of modern work the professional electrician, the heating and ventilating engineer, and the many other specialists whose work contributes to the finished product must each be left to attend to his own details. The architect cannot be expected to master the intricacies of their work, of which they are the most competent judges if kept within their proper sphere.

The architect is needed to supervise upon

his own initiative only as far as the finished product is concerned. The obtaining of estimates, preparation of contracts, the mass of correspondence and other details consequent upon the erection of a great building, together with the vast business interests of the work, are supervised and managed by the corporation directly through its well-oiled and experienced business machinery.

This is the System of the Future,

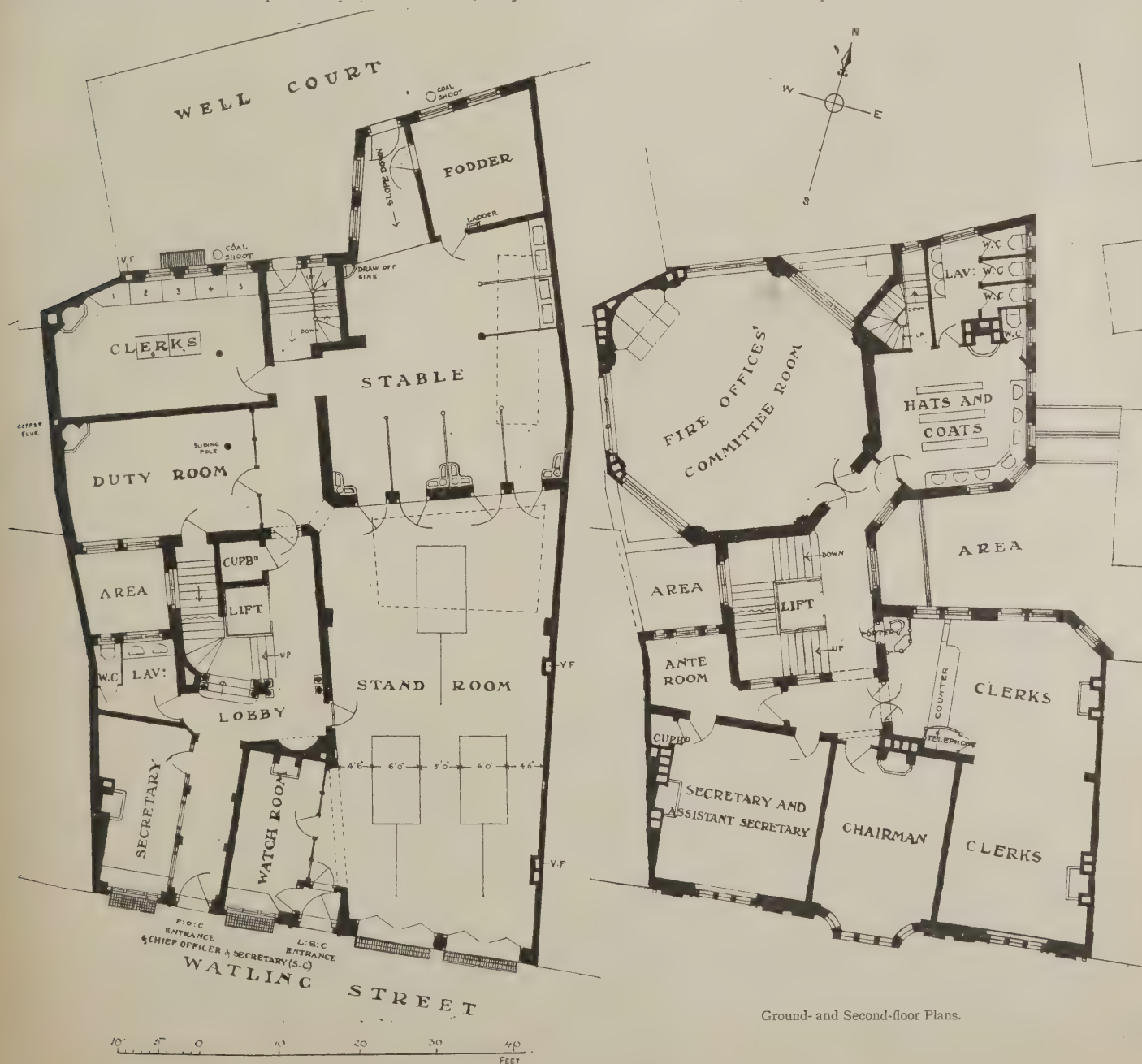
in some cases of the present. Under its influence the architect will again be left time to design, to plan, to draw, to give the best results in the specialty for which he is properly equipped—in fact, to be an architect. His power will not be as great as under the older system, but he will be an artist and will accomplish his mission.

There is no use in bemoaning the conditions which have caused this decadence of the most ancient of the arts. Architecture never created a civilization. Its monuments are the answers to that civilization's needs. Its lasting monuments are its successful answers, created under conditions which allowed of the putting forth of the best efforts of the designers. Other conditions now confront us; from them there is no appeal. They are fixed; they all tend in one direction.

How will architecture live as a vital artistic force under the new conditions unless it obeys the industrial law?—*Architectural Record*.

SALVAGE CORPS BUILDING.

THE proposed new building of the London Salvage Corps, here illustrated, is intended to occupy a site part of which is identical with its present premises. A large portion of the ground floor is necessarily occupied with the stand room for the Salvage Corps "traps." At the rear are the stables. The basement is mostly taken up with accommodation for the men of the Salvage Corps, who also have a large dormitory on the mezzanine, from which there will be an approach to the watch-room by a sliding pole. In the upper portion there is a residence for a chief officer, as well as accommodation for three married men. The second and third floors are taken up by the rooms for the Fire Offices Committee, who will have on the second floor an octagon-shaped meeting hall with ceiling of convex form. The exterior elevations will be entirely of Portland stone. The design of Mr. Paul Waterhouse was selected in a limited competition.



Ground- and Second-floor Plans.

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :				
Aug.	31	Barley—Fittings to Stores	Barley Co-operative Society ...	H. B. Buckley, Architect, 85 Commercial Street, Batley.
"	31	Bridgend—Library	Free Library Committee... ..	P. J. Thomas, Architect, Station Road, Bridgend.
"	31	New Romney, Kent—Re-slating Roof of Town Hall	Town Council	Borough Surveyor, New Romney.
"	31	Wolverton—Schools	Education Committee	Clerk of Works Education Offices, Aylesbury.
"	31	Ynysybwl—Chapel	Building Committee	W. W. Lewis & Morgan, Architects, Market Street, Pontypridd.
Sept.	1	Merthyr Tydfil—Alterations to Schools	Guardians	T. Roderick, Architect, Clifton Street, Aberdare.
"	1	London, N.—School	Finchley U.D.C.	W. G. Wilson, Architect, 5 Bloomsbury Mansions, Hart Street, W.C.
"	2	Burnopfield—School	Urban District Council	A. W. Kyle, Architect, Burnopfield, R.S.O.
"	2	Taibach—Council Offices	Gas Co.	J. Cox, Surveyor, Port Talbot, Wales
"	2	Berkhamstead—Retort-house	City Council	A. F. Phillips, M.I.C.E., 38 Parliament Street, London, S.W.
"	2	Exeter—Dwellings	County Asylum Committee	City Engineer and Surveyor, Exeter.
"	2	Exminster—Cottages	Town Council	E. H. Harbottle, County Chambers, Exeter.
"	4	Kew—Convenience	Urban District Council	Borough Surveyor, Town Hall, Richmond.
"	4	Ramscombe—Farmhouse... ..	Gas Co.	H. A. Hosking, Architect, Landrake, St. Germans, Cornwall.
"	4	Norwich—Asylum Extension	Corporation	A. E. Collins, City Engineer, Guildhall, Norwich.
"	4	Castlewellan, Ireland—Houses	Trustees	W. H. Mills, Engineer, Amiens Street Terminus, Dublin.
"	4	Coventry—Meter-houses	County Council	F. W. Stevenson, Gasworks, Coventry.
"	4	Glasgow—Alterations	Lord Kensington	W. W. Lackie, Electrical Engineer, 75 Waterloo Street, Glasgow.
"	4	Rhymney—Chapel Alterations	Urban District Council	W. Jones & W. D. Morgan, Architects, Pentre, Rhondda.
"	4	Shepton Mallet—School	Corporation... ..	Mackay & Son, Shepton Mallet.
"	4	St. Bride's—Improvements to Mansion House	Great Western Railway Co.	J. Fergusson, St. Bride's, Littlehaven, South Wales.
"	4	Aberdare—Classrooms	H.M. Office of Works	J. Morris, Town Hall, Aberdare.
"	4	Sawbridgeworth—Fire-station	Corporation... ..	Council Offices, Sawbridgeworth.
"	5	Portsmouth—Library	Pembroke Estate Co.	A. Hellard, Town Clerk, Portsmouth.
"	5	Lye—Goods Shed	Education Committee	Engineer, G.W.R. Station, Wolverhampton.
"	5	Blackburn—Post Office	Great Western Railway Co.	Postmaster, Blackburn.
"	5	Aberdare—Houses	H.M. Office of Works	A. T. James, Hawthorne House, Gloucester Terrace, Aberdare.
"	5	Derby—Car-sheds Extension	Corporation... ..	J. Ward, Borough Surveyor, Derby.
"	5	Goodwick—Alterations	Education Committee	Jenkinson & White, 1 Princes Street, Westminster, S.W.
"	5	Newcastle-on-Tyne—Playshed	Great Western Railway Co.	A. Goddard, Education Offices, Newcastle.
"	5	Templeton—Station Buildings	Trustees	Engineer, Neath Station
"	6	Brynmaur—Alterations to School	Managers	H. Waters, Architect, Beaufort.
"	6	Pontypool—Alterations to Schools	Metropolitan Asylums Board	H. J. Griggs, Architect, Newport, Mon.
"	6	Rustington—Sun-room, &c.	Guardians	Rowland Plumble & Harvey, 13 Fitzroy Square, London, W.
"	6	Clutton—Alterations at Workhouse	Education Committee	W. F. Bird, Architect, Midsomer Norton.
"	7	Croydon—School	Trustees	J. Smyth, Clerk, Education Offices, Croydon.
"	7	Dinnington—Schoolroom	Admiralty	Rev. H. Jones, Prospect Villa, Kiveton Park, Dinnington.
"	8	Barry, Glamorgan—Coastguard Buildings	Technical Instruction Committee	Civil Engineer, H.M. Dockyard, Pembroke Dock.
"	9	Waterford—School	St. Pancras Borough Council	Secretary's Office, Town Hall, Waterford.
"	11	London, N.—Cloakrooms	Education Committee	T. W. Aldwinckle, 20 Denman Street, London Bridge, S.E.
"	11	Lydney—School	Education Committee	M. H. Medland, Architect, 15 Clarence Street, Gloucester.
"	11	Ipswich—School	Town Council	E. T. Johns, Thoroughfare, Ipswich.
"	11	Chepping Wycombe—School	Council	Borough Surveyor, Euston Street, High Wycombe.
"	11	Finsbury—Convenience	Guardians	Borough Surveyor, Finsbury Town Hall, Rosebury Avenue, E.C.
"	12	Isleworth—Additions to Workhouse	H.M. Works Department	W. H. Ward, Architect, Paradise Street, Birmingham.
"	12	Eskdalmuir—Observatory Superstructure	Co-operative Society	H.M. Office of Works, 3 Parliament Square, Edinburgh.
"	13	Hathern—Cottages		S. Smith, Tanners Lane, Hathern.
ENGINEERING :				
Aug.	31	Peterborough—Pumping Station... ..	Town Council	J. C. Gill, Waterworks Engineer's Office, Peterborough.
Sept.	1	Merthyr Tydfil—Destructor Plant	Urban District Council	T. F. Harvey, Town Hall, Merthyr.
"	1	Wolverhampton—Pumping Engine	Corporation	E. A. B. Woodward, Town Hall, Wolverhampton.
"	1	Morley—Main-laying	Waterworks Committee	W. E. Putnam, Borough Engineer, Morley.
"	1	Hereford—Boilers	Guardians	R. Moore, Clerk, 8 St. John's Street, Hereford.
"	2	Ashton-under-Lyne—Generator	Electricity Committee	Borough Electrical Engineer, Wellington Road, Ashton-under-Lyne.
"	2	Salford—Water-softening Plant	Electricity Committee	Borough Electrical Engineer, Electricity Works, Pendleton.
"	2	Taunton—Boiler	Corporation... ..	Borough Electrical Engineer, St. James Street, Taunton.
"	4	London, E.C.—Lighthouse	Trinity House	Trinity House, London, E.C.
"	4	Sunderland—Bridge Widening	Corporation... ..	Borough Engineer, Town Hall, Sunderland.
"	4	Southampton—Pumping Engines	Corporation... ..	Borough Engineer, Market Chambers, 123 High St., Southampton.
"	4	Scarborough—Bridge	North-Eastern Railway Co.	W. J. Cudworth, Engineer, York.
"	5	London, S.E.—Alterations to Engineering Arrangements... ..	Metropolitan Asylums Board	Metropolitan Asylums Board Offices, Embankment, London, E.C.
"	5	Neath—Reconstruction of Bridge	Great Western Railway Co.	Engineer, Paddington Station.
"	5	London, S.W.—Boiler Feed Pumps	Metropolitan Asylums Board	Office of the Asylums Board, Embankment, E.C.
"	6	Halsall—Bridges	Rural District Council	C. Law-Green, Surveyor, Wigan Road, Ormskirk.
"	6	Selby—Reservoir	Urban District Council	P. Griffiths, M.I.C.E., 54 Parliament Street, Westminster, S.W.
"	11	Sculcoates—Swing Bridge... ..	North-Eastern Railway Co.	W. J. Cudworth, Engineer, York.
"	11	Bristol—Pumping Machinery	Docks Committee... ..	W. W. Squire, Cumberland Road, Bristol.
"	12	Bishop's Stortford—Pumping Engine	Urban District Council	T. Swatheridge, Council Offices, 7 North Street, Bishop's Stortford.
"	12	Cardiff—Motor Ambulance	Watch Committee... ..	J. L. Wheatley, Town Clerk, Cardiff.
"	15	Alicante, Spain—Harbour Works	Harbour Board	Harbour Board, Alicante.
"	18	Portsmouth—Machinery	Education Committee	A. H. Bone, Cambridge Junction, Portsmouth.
"	20	Immingham—Dock	Directors	Sir J. Wolfe Barry & Partner, 21 Delahay Street, Westminster, S.W.
"	25	Sewree, Bombay—Pier	Bombay Port Trustees	Sir J. Wolfe Barry, 7 The Sanctuary, Westminster, S.W.
"	28	Zulcea, Roumania—Water-supply	Municipality	Municipal Offices, Zulcea.
IRON AND STEEL :				
Aug.	31	Todmorden—Fencing	Town Council	Waterworks Office, 5 Rochdale Road, Todmorden.
Sept.	1	Morley—Pipes	Waterworks Committee	W. E. Putnam, Borough Engineer, Morley.
"	5	London, W.—Girder Work	Great Western Railway Co.	Engineer, Paddington Station.
"	7	Southwell, Notts.—Pipes	Rural District Council	H. Walker & Son, Albion Chambers, King Street, Nottingham.
"	16	Island of Barra—Pipes, &c.		J. Wedderspoon, Engineer, The Castle, Inverness.
Oct.	9	Mussoorie, India—Pipes, &c.	Municipal Board	C. H. Shanahan, Municipal Office, Mussoorie.
PAINTING AND PLUMBING :				
Aug.	31	Accrington—Painting, &c... ..	Bowling Green Club	Secretary, Bowling Green Club, Accrington.
Sept.	1	Wigmore—Painting Schools	Managers	J. W. Allen, Architect, High Street, West Bromwich.
"	1	Grimsby—Painting Forty-eight Almshouses		S. Ellis & Sons, Victoria Street, Grimsby.
"	4	Durham—Painting Schools	Education Committee	E. Potts, Clerk, Greenfield, Ushaw Moor.
"	5	Grimsby—Plumbing... ..	Corporation... ..	H. G. Whyatt, Borough Engineer and Surveyor, Town Hall Square, Grimsby.
"	6	Bootle—Painting Town Hall	Corporation... ..	Borough Engineer, Town Hall, Bootle.
"	11	Malton and Thirsk—Painting	North-Eastern Railway Co.	H. J. Rudgard, Engineer, North-Eastern Station, York.
"	14	Fulham—Redecorating Children's Homes	Guardians	E. J. Mott, Clerk, Guardians' Offices, Fulham Palace Road, W.
"	15	Canterbury—Painting Asylum	Asylum Committee	W. J. Jennings, Architect, 4 St. Margaret's Street, Canterbury.
"	18	Canterbury—Painting at Electricity Works	Electric Light Committee	A. L. Turley, City Surveyor, Canterbury.
ROADS AND CARTAGE :				
Aug.	31	Walton-on-Thames—Granite	Urban District Council	R. Wilds, Surveyor, Council Offices, Walton-on-Thames.
Sept.	1	Prestwich—Repaving, &c.	Urban District Council	Surveyor, Chester Bank, Prestwich.
"	1	Branksome—Re-forming, &c.	Urban District Council	S. J. Newman, Surveyor, Lake Road, Branksome.
"	2	Carrickfergus—Stones	Urban District Council	J. Boyd, Clerk, Town Hall, Carrickfergus.
"	4	Skipton—Street Works	Urban District Council	J. Mallinson, Surveyor, Town Hall, Skipton.
"	4	Steyning—Paving and Kerbing	Rural District Council	F. Slaughter, Surveyor, High Street, Steyning.
"	4	Southampton—Stone	Corporation... ..	J. A. A. Crowther, Borough Engineer, Southampton.
"	5	Elland—Street Works	Urban District Council	P. H. Whitwam, Surveyor, Council Offices, Elland.
"	7	Swansea—Road Works	Rural District Council	T. Trevor Williams, Surveyor, Alexandra Road, Swansea.
"	12	Ovingdean—Road Construction		E. Millard, Surveyor, 1 Finsbury Circus, London, E.C.
"	15	Elham—Asphalting Playground	Guardians	E. Lonergan, Clerk, 11 Cheriton Place, Folkestone.
"	16	Harrow-on-the-Hill—Granite	Urban District Council	J. Percy Bennetts, Surveyor to the Council, Harrow.
"	18	Camberwell—Making-up	Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, S.E.
"	25	Bishop's Stortford—Gravel	Urban District Council	Surveyor to the Council, Bishop's Stortford.
"	25	Bishop's Stortford—Materials	Urban District Council	T. Swatheridge, Clerk, Council Offices, Bishop's Stortford.

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Clover, best	per load	3	12	0	4	0	0
Hay, good	do.	3	3	0	3	10	0
Sainfoin mixture	do.	3	7	0	3	15	0
Straw	do.	1	10	0	1	18	0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1	0	5	—	—	—
Colza Oil, English ...	do.	1	2	6	—	—	—
Copperas ...	per ton	2	0	0	—	—	—
Lard Oil ...	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate ...	per ton	16	0	0	—	—	—
Do. red ...	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	0	17	10½	—	—	—
Petroleum, American ...	per gal.	0	15	0	—	—	—
Do. Russian ...	do.	0	0	5½	—	—	—
Pitch ...	per barrel	0	8	0	—	—	—
Shellac, orange ...	per cwt.	8	16	0	9	6	0
Soda, crystals ...	per ton	3	2	6	3	5	0
Tallow, Town ...	per cwt.	1	5	6	1	5	9
Tar, Stockholm ...	per barrel	1	6	6	—	—	—
Turpentine ...	per cwt.	2	5	9	—	—	—

METALS.

Copper, sheet, strong ...	per ton	87	0	0	—	—	—
Iron, Staffs, bar ...	do.	5	15	0	8	0	0
Do. Galvanized Corrugated Sheet ...	do.	10	15	0	10	17	6
Lead, pig, Soft Foreign ...	do.	14	5	0	—	—	—
Do. do. English common brands ...	do.	14	10	0	—	—	—
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	15	0	0	—	—	—
Do. pipe ...	do.	16	0	0	—	—	—
Nails, cut clasp, 3in. to 6in. ...	do.	9	5	0	—	—	—
Do. floor brads ...	do.	9	0	0	—	—	—
Steel, Staffs, Girders and Angles ...	do.	5	7	6	5	12	6
Do. do. Mild bars ...	do.	6	0	0	6	5	0
Tin, Foreign ...	do.	152	12	6	153	2	6
Do. English ingots ...	do.	153	0	0	153	10	0
Zinc, sheets, Silesian ...	do.	26	15	0	—	—	—
Do. do. Vieille Montaigne ...	do.	27	0	0	—	—	—
Do. Spelter ...	do.	25	2	6	25	15	0

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel ...	per load	2	15	0	5	0	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American ...	do.	3	0	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Skelleftea, Yellow, 1st, 4x7 ...	per std.	10	15	0	—	—	—
Do. do. do. do. 2½x7 ...	do.	10	5	0	—	—	—
Do. do. do. do. 3x9 ...	do.	12	5	0	—	—	—
Do. do. do. do. 2nd, 4x7 ...	do.	9	15	0	—	—	—
Do. Archangel, White, 2nd, 3x9 ...	do.	10	5	0	—	—	—
Do. do. Yellow, Unsorted, 3x4 ...	do.	8	15	0	—	—	—
Do. Blankholm, Yellow, 1st, 3x4½ ...	do.	9	0	0	—	—	—
Do. do. do. do. 3x4 ...	do.	8	10	0	—	—	—
Do. do. do. do. 2½x7 ...	do.	9	0	0	—	—	—
Do. Räfsö, Yellow, 2nd, 3x4½ ...	do.	8	10	0	—	—	—
Do. St. Petersburg, Yellow, 1st, 2½x11 ...	do.	10	5	0	—	—	—
Battens, all kinds ...	do.	6	10	0	11	10	0
Flooring Boards rim. prepared, 1st ...	per square	0	10	3	0	11	0
Do. 2nd ...	do.	0	10	0	—	—	—
Do. 3rd, &c. ...	do.	0	7	3	—	—	—

HARD WOODS.

Ash, Quebec ...	per load	3	17	6	7	5	0
Birch, New Brunswick ...	do.	2	5	0	4	17	6
Do. Quebec do. ...	do.	2	10	0	5	0	0
Box, Turkey ...	per ton	7	0	0	20	0	0
Cedar, Cuba ...	per ft. sup.	0	0	3½	0	0	4
Do. Honduras ...	do.	0	0	3½	0	0	4
Do. Tobasco ...	do.	0	0	5	—	—	—
Whitewood, American, logs ...	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards ...	[do.]	0	1	3	0	3	0

Elm, Quebec ...	per load	£	s.	d.	£	s.	d.
Jarrah, plank ...	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0	0	4½	0	0	6
Do. Tobasco ...	do.	0	0	4	0	0	6
Do. Cuba ...	do.	0	0	3	0	0	4
Do. African ...	do.	0	0	3	0	0	4½
Oak, Wainscot ...	per log.	3	0	0	6	15	0
Teak, Indian, logs ...	per load	10	0	0	19	0	0
Do. do. planks ...	do.	13	0	0	20	10	0

New Companies.

BOROUGH BRICK CO., LTD., Nelson. Capital: £10,000.
 FLEETWOOD & CALVERT, LTD., brick and lime merchants, &c. Capital: £1,000.
 ATKINSON & CO., LTD., builders, contractors, &c. Capital: £30,000.
 J. T. DOVE, LTD., builders' merchants, Newcastle-on-Tyne. Capital: £500.
 W. AKERS & CO., LTD., builders and contractors, South Norwood. Capital: £6,000.
 BRITISH CONTRACTS CORPORATION, LTD., to acquire certain concessions and rights specified in an agreement between D. F. Basden (as trustee) and another, and the corporation, and to carry on the business of contractors for public works of all kinds, &c., 156, Leadenhall Street, E.C. Capital: £25,000.

Coming Events.

Saturday, September 2.

INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—Midland District Meeting, Kettering.

Wednesday, September 6.

INSTITUTE OF SANITARY ENGINEERS.—Election Committee at 3 p.m.; Organizing Committee at 5 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Opening of Exhibition of Drawings and Photographs of Architectural Refinements, National Portrait Gallery, at 4 p.m.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending August 25th nineteen failures in the building and timber trades in England and Wales were gazetted.

P. R. HOGGEN, builder, Lyminge. R.O. Aug. 18th.

T. STREET, builder, Petworth. R.O. Aug. 18th.

WALTER BROTHERS, builders, Bradford. Liabilities £791; assets £464; deficiency £327.

J. H. HARWOOD, painter and paperhanger, Leeds. P.E., Leeds C.C., Sept. 4th, at 11.

J. S. DOUGLAS, builder, Northampton. P.E., Northampton County Hall, Oct. 24th, at 12.

W. BARLEY, building contractor and surveyor, Manchester. R.O. Aug. 16th.

ARNOLD BELL & CO., builders, Bromley. First meeting, 24, Railway Approach, London Bridge, Sept. 1st, at 3. P.E., Croydon C.C., Oct. 11th, at 11.

STORER BROTHERS, builders and contractors, Leicester. First meeting, O.R.'s, Leicester, Aug. 30th, at 12. P.E., The Castle, Leicester, Sept. 15th, at 10.

C. GIMSON, builder and contractor, 33, Lawrence Lane, E.C. First meeting, London Bankruptcy Court, Aug. 31st, at 12. P.E., same, Oct. 3rd, at 11.30.

WARRY & HICKS, builders, Bournemouth. First meeting, O.R.'s, Southampton, Aug. 30th, at 4. P.E., Poole Town Hall, Oct. 4th, at 11.30.

G. H. WILKINS, surveyor, Bristol and Weston-super-Mare. First meeting, O.R.'s, Bristol, Aug. 30th, at 11.30. P.E., Bristol Guildhall, Oct. 13th, at 12.

E. FIELDING, JUNR., builder, Birmingham. First meeting, 191, Corporation Street, Birmingham, Aug. 31st, at 12. P.E., Birmingham C.C., Sept. 27th, at 2.

F. HODGES, builder, Isleworth and Ealing. Gross liabilities £2,727; estimated surplus from securities £2,859.

FOREMAN BROTHERS, sanitary surveyors, Upper Norwood. First meeting, 24, Railway Approach, London Bridge, Aug. 31st, at 12.30. P.E., Croydon C.C., Oct. 11th, at 11.

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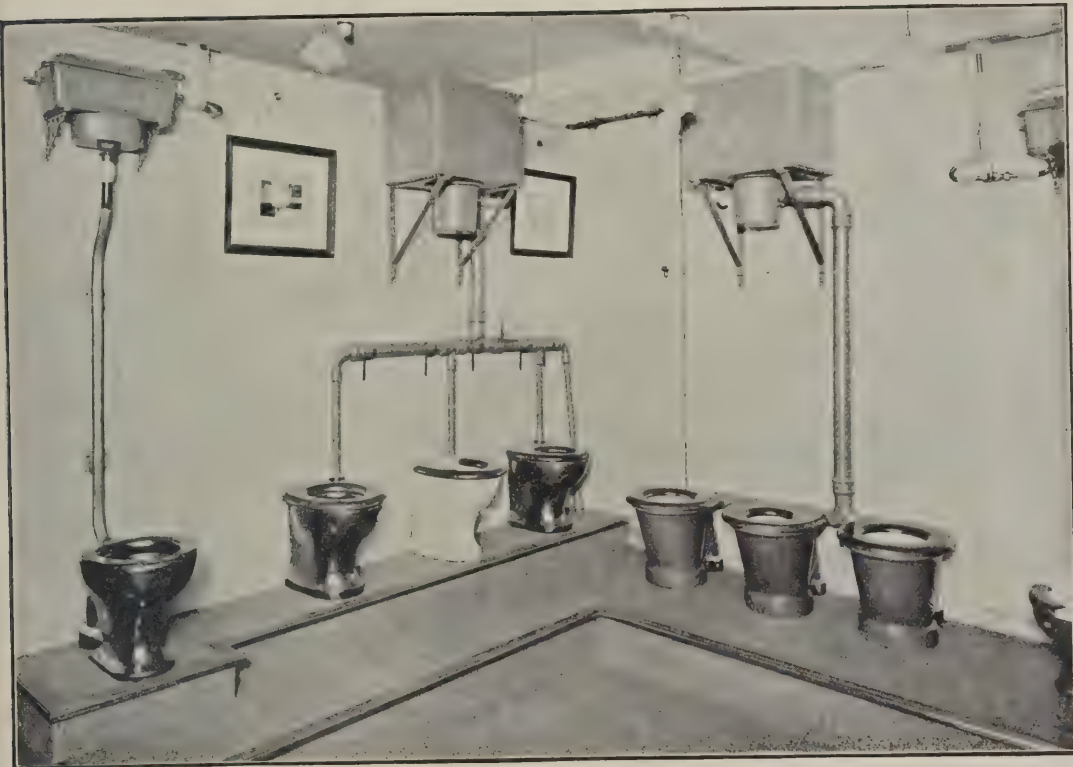
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 Paris 1900

The

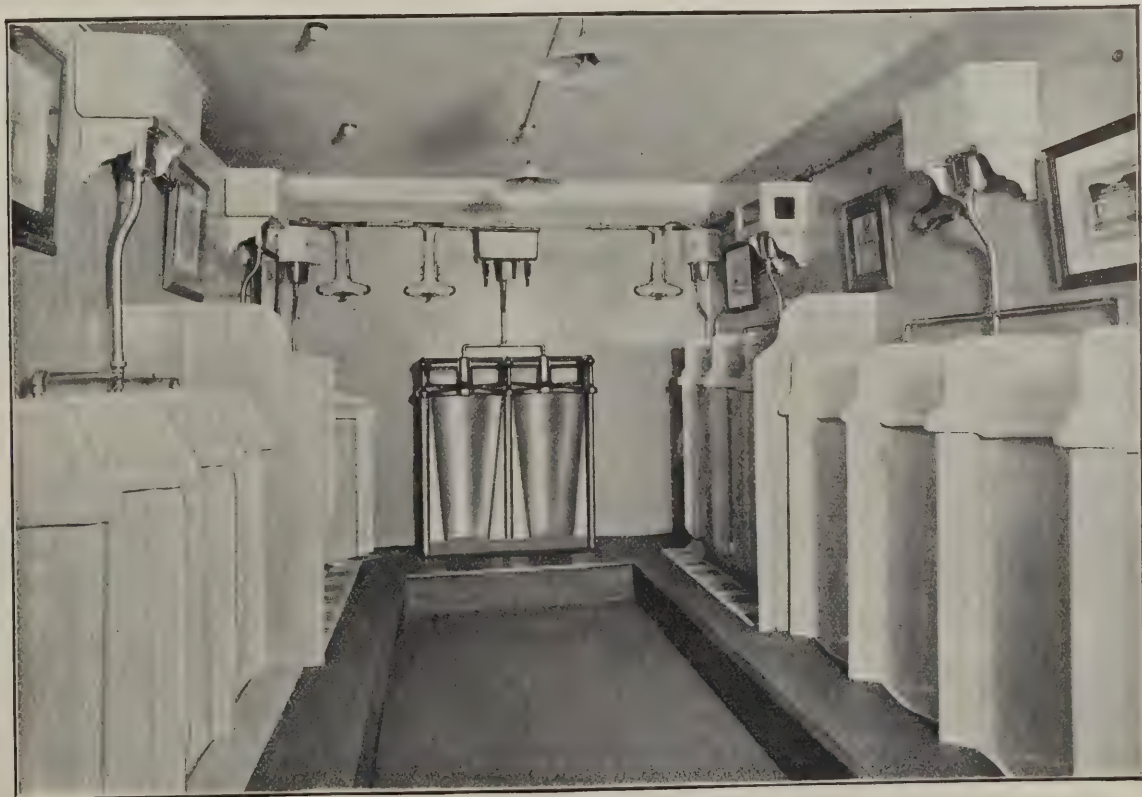
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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Birmingham.—Accepted for the erection of a tramway car depot in Coventry Road, for the Corporation. Messrs. Ingall & Son, architects:—

W. Cunliffe, 39, Corporation Street ... £20,746

Brentwood.—For the conversion of the model lodging-house into a working-men's club, for Mr. J. W. Cook, J.P. Mr. Hugo R. Bird, architect and surveyor, Brentwood:—

Alterations. Schedule 2.	
E. Dix	... £1,190 ... 38 0 0
F. W. Burtwell	... 1,120 ... 29 0 0
F. W. Jarvis	... 1,049 ... 29 15 0
Painting—W. Dean & Sons, £84.	

Canwell.—Accepted for additions to the hall and stable courtyard, and the erection of a new farmhouse at Roughley, on the Canwell Hall Estate, for Mr. Philip S. Foster, M.P. Mr. C. M. C. Armstrong, architect, 5, High Street, Warwick:—

W. J. Whittall & Son, Birmingham £1,199 18 3

Chesham.—For additions and alterations to the brewery, Chesham, for the Chesham Brewery. Messrs. R. W. Andrews & Co., brewery architects and engineers, 148 and 150, Pentonville Road, London, N.:—

J. J. Wheeler	... £3,244 15 0
G. Bollom	... 2,940 0 0
Webster & Cannon	... 2,840 0 0
Honour & Son	... 2,598 0 0
J. Mead	... 2,525 0 0
G. Darlington	... 2,400 0 0
W. Abbott & Son	... 2,375 0 0
F. G. Rust*	... 2,240 0 0

* Accepted.

Fmyvale (co. Monaghan).—For the erection of a dispensary residence. Mr. W. A. Scott, A.R.I.B.A., M.S.A., M.R.I.A.I., architect, Drumcondra:—

Brickwork. Masonry.	
M'Kay and M'Nally,	
Dungannon	... £1,350 ... £1,325 0 0
J. Callan, Castleblaney	... 1,150 ... 1,220 0 0
H. M'Conn, Ballymena	... 1,080 ... 1,640 0 0
F. Duffy, Monaghan	... 1,075 ... 1,035 0 0
H. M'Geough,* Monaghan	939 ... 924 18 9

* Accepted.

Glyn-Neath (Wales).—For the alteration, extension, re-roofing and heating of Addoldy Chapel, Glyn-Neath, for the Building Committee. Mr. J. Cook Rees, architect, Neath:—

Harret & Sons, Glyn-Neath	... £1,550
Waring, Cole & Waring, Neath	... 1,542
Walters & Johns, Morriston	... 1,530
Thomas & Jones, Morriston	... 1,525
D. Davies, Cardiff	... 1,485
D. Jenkins, Swansea	... 1,450
J. D. Wilkins, Aberdare	... 1,392
Price Brothers,* Pontenna Road, Cardiff	1,367

* Accepted.

Guildford.—For the rebuilding of Nos. 189 and 190, High Street, for Mr. W. J. Lympos. Messrs. Clemence & Moon, architects, Guildford. Quantities by the architects:—

F. Milton	... £3,260
Tribe & Robinson	... 3,225
Drowley & Co.	... 3,195
H. Brand	... 3,123
A. Johnson,* Guildford	... 3,093

* Accepted.

Guildford.—For the erection of a house in London Road, for Mr. L. C. Biddle. Messrs. Clemence & Moon, architects, Guildford. Quantities by the architects:—

Swayne & Son	... £1,347
A. Johnson	... 1,331
Stanley Ellis	... 1,322
Tribe & Robinson	... 1,315
E. & J. H. Holden, Cranleigh	... 1,298

* Accepted.

Ipswich.—For the erection of shops, warehouses, &c., in Foxhall Road, Ipswich, for the Ipswich Industrial Co-operative Society, Ltd. Mr. H. Winkworth, architect, Ipswich:—

F. Bennett	... £1,475 0 0
H. J. Linzell	... 1,460 0 0
C. Stearn & Co.	... 1,460 0 0
C. A. Green	... 1,387 5 0
A. Sadler	... 1,379 10 0
S. Skerrett	... 1,361 10 0
E. Catchpole & Sons, Ltd.*	1,341 0 0

* Accepted. [Architect's estimate, £1,561.]

Ipswich.—For the proposed alterations and additions to the county hall, St. Helen's Street, Ipswich, for the East Suffolk County Council. Mr. Henry Miller, county surveyor, 16, Museum Street, Ipswich:—

Oak Building Co., Cambridge	... £9,570
Kenny	... 9,003
Ward, Felixstowe	... 8,914
Girling	... 8,715
Bennett	... 8,630
Grimwood	... 8,498
Roper	... 8,486
Linzell	... 8,256
T. Parkington & Son*	7,400

* Accepted. [Rest of Ipswich.]

Minehead.—For the erection of administration block, two isolation ward blocks, laundry, stables and other buildings, together with works of water-supply and drainage, boundary walls, &c., at Vinnehead, near Minehead, for the Minehead and Williton (West) District Hospital Committee. Mr. T. H. Andrew, architect, Minehead:—

J. Linton & Co., Newport, Mon.	... £8,950 0 0
F. Parker & Sons	... 8,496 7 10

E. Love, Bristol	... £8,240 0 0
R. Wilkins & Sons, Bristol	... 7,850 0 0
D. Davis, Cardiff	... 7,490 0 0
A. J. Spiller, Taunton	... 7,350 0 0
G. Pollard & Co., Taunton	... 7,185 0 0
J. Hatherley, Bristol	... 6,997 0 0
Pethick Brothers, Plymouth	... 6,744 0 0
A. Darby, Bristol	... 6,599 0 0
Hayward & Wooster, Bath	... 6,599 0 0
A. J. Colborne, Swindon	... 6,579 10 0
H. J. Spiller & Son, Taunton	... 6,350 0 0
H. W. Pollard, Bridgwater	... 6,350 0 0
Passmore & Derrick	... 5,974 10 11
J. Hurford	... 5,620 0 0
W. Harrison & Son	... 5,589 0 0
J. Burgess	... 5,584 0 0

Note.—No tender is yet accepted. The specifications are to be altered and the two lowest will be asked to re-tender. [Rest of Minehead.]

Monkseaton.—For private improvements at Monkseaton, for the Whitley and Monkseaton Urban District Council. Mr. J. Moore, F.I.S.E., surveyor:—

Thornton & Co., South Shields	... £2,407 4 3
J. W. Robson, Newcastle	... 2,308 19 0
M. D. Young, Hexham	... 2,227 6 9
G. E. Simpson,* Newcastle	2,209 6 4

[Surveyor's estimate, £2,399 19s. 7d.]

* Accepted.

Newton Abbot.—For the erection of a nursery, &c., at the workhouse, for the Guardians. Mr. S. Segar, architect, Union Street, Newton Abbot:—

Wilkins & Sons	... £1,989 0 0
Parker Brothers	... 1,975 0 0
E. Pike	... 1,935 0 0
W. E. Blake	... 1,890 0 0
F. J. Zeal'ey	... 1,849 0 0
R. E. Narracott	... 1,827 12 6
H. C. Goss	... 1,823 0 0
J. J. Stokes	... 1,820 0 0
A. C. Jones	... 1,800 0 0
F. A. A. Stacey	... 1,780 0 0
H. Mills,* Newton Abbot	1,728 12 7
F. J. Badcock	... 1,720 0 0

* Accepted.

South Twerton (Bath).—For an extension of the three departments of the South Twerton Council School, comprising five additional classrooms, for the Somerset County Education Committee. Mr. William F. Bird, architect, Midsomer Norton, Somerset. Quantities by architect:—

Hayward & Wooster	... £1,943 0 0
E. Love, Bristol	... 1,925 0 0
Erwood & Morris	... 1,893 0 0
A. E. Denby & Co., Bristol	... 1,799 0 0
A. Willis & Sons	... 1,784 0 0
E. Chancellor & Sons	... 1,750 0 0
J. Long & Sons	... 1,727 0 0
A. J. Colborne, Swindon	... 1,687 2 0
F. Amery	... 1,628 0 0
F. I. Blackmore, Twerton-on-Avon	1,579 0 0
William Webb*	1,519 0 0

* Accepted. [Rest of Bath.]

Walthamstow.—Provisionally accepted for the erection and completion of the Prospect Hill Presbyterian Church, for the Building Committee. Mr. J. Williams Dunford, architect, 100, Queen Victoria Street, London, E.C.:—

Sands & Burley, Canning Road ... £5,240

Welton, Midsomer Norton (Somerset).—For an extension of the Welton Council Schools, comprising three additional classrooms, with teachers' retiring-room, and enlargement of offices, for the Somerset County Education Committee. Mr. William F. Bird, architect, Midsomer Norton. Quantities by architect:—

W. R. Moody, Trowbridge	... £1,956 8 8
J. Child & Son, Barrow Gurney	... 1,862 0 0
Hayward & Wooster	... 1,847 0 0
E. Love, Bristol	... 1,799 0 0
A. E. Denby & Co., Bristol	... 1,700 0 0
A. J. Colborne, Swindon	... 1,649 10 0
William Webb, Midsomer Norton	1,649 0 0
Erwood & Morris	... 1,645 0 0
W. A. Catley, Midsomer Norton	... 1,633 0 0
A. Willis & Sons	... 1,622 0 0
F. J. Amery,* Grove Street	1,546 0 0
	1,520 0 0

* Accepted. [Rest of Bath.]

Ynysybwl.—Accepted for alterations and additions to Zion English Baptist Chapel, Ynysybwl, for the Trustees. Messrs. Morgan & Elford, architects, 1, Jeffrey Street, Mountain Ash and Aberdare:—

Williams & Son, Ynysybwl ... £1,600

New Cavalry Barracks at Norwich are to be erected at a cost of about £200,000.

A new Roman Catholic Church at Stirling has been opened. The building, which was erected from plans by Messrs Pugin & Pugin, of London, is in the late Decorated style of Gothic architecture, having nave and side aisles, chancel and side chapels, &c. Red sandstone has been used in the construction of the church, the columns and arches in the interior being from Northumberland quarries. Six stone arches, with circular columns, divide the nave from the aisles. The aisle roofs are carried on arches which spring from a point low down on the aisle walls, and on the nave side rest on richly-carved stone corbels. The high altar is of Beer stone, with rouge marble panels and green Connemara marble columns. The side altar is of alabaster.

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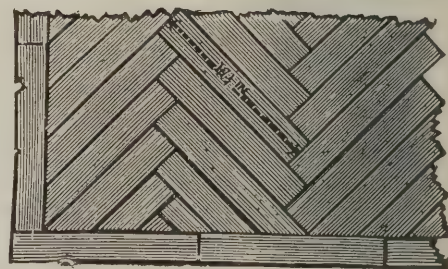
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Complete List of Contracts Open.—continued.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
SANITARY:				
Sept.	1	Sedgefield—Sewerage Works	Rural District Council	D. Balfour & Son 3 St. Nicholas Buildings, Newcastle-on-Tyne.
"	1	Selby—Cleansing, &c., Drains	Urban District Council	Commissioners' Office, Abbey Yard, Selby.
"	2	Northwood—Sewer	Urban District Council	W. L. Carr, Council Offices, Northwood, R.S.O.
"	2	Caversham—Drain	Urban District Council	A. J. Smith, Surveyor, Council Offices, Caversham.
"	2	Ellesmere Port—Sewer	Urban District Council	J. M. Hudson, Surveyor, Bank Buildings, Ellesmere Port.
"	4	West Roddymoor—Drainage Works	Urban District Council	Surveyor's Office, Council Offices, Crook.
"	7	Southwell—Sewerage Works	Rural District Council	H. Walker & Son, Albion Chambers, King Street, Nottingham.
"	18	Hollingbourne—Sewerage Works	Guardians	Fairbank & Son, Civil Engineer, Land 11 Chambers, York.
"	21	Camberley—Sewerage and Sewage-disposal Works... ..	Urban District Council	Willcox & Raikes, 63 Temple Row, Birmingham.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Sept.	1	Elgin—Cemetery Extension	£10 10s.	—	Stewart & M'Isaac Solicitors, Elgin.
"	23	Cheshunt—Library	—	£1 1s.	A. Collingwood Lee, Manor House, Cheshunt.
Oct.	9	London—Shop Fronts	£75	—	W. H. Smith & Sons, 126 Strand, W.C.
"	16	Preston—School	£50, £30 and £20	—	Director of Education, Education Offices, Preston.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

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ABLE ASSISTANT (24½) seeks RE-ENGAGEMENT. Careful draughtsman.—F. B. Hooper, The Hermitage, High Wycombe.

A GOOD STAIRCASE and GENERAL HAND desires Leading or Foreman's place. Accustomed to work from Drawings and Specifications and to the control of men.—HITCHENS, 4, Goldsdown Road, Brimsdown, Middlesex. 1298

ARCHITECT and SURVEYOR'S ASSISTANT, A.R.San.I., desires ENGAGEMENT; 10 years' varied experience. Measuring up, contract drawings, details, specifications, knowledge of quantities, surveying and levelling, superintending works.—Box 1278, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT'S JUNIOR ASSISTANT (20) disengaged September 4th. Five years' experience. London or country. Working drawings, details, good tracer, colourist, &c. General office routine. Salary 25s.—A. G. S., "Kirkdale," Stanmore Road, Leytonstone, Essex. 1279

ARCHITECT'S ASSISTANT (25), experienced; free after 16th September. Domestic and all work. Salary 35s.—J. SUGDEN, "Beeches," Frimley Road, Camberley. 1297

ARCHITECT and SURVEYOR'S ASSISTANT, 10 years' good all-round experience, desires re-engagement, temporary or permanent.—For reference, &c., write, X. Y. Z., 104, Derby Road, Loughborough Leicester. 1300

ARCHITECT'S ASSISTANT; 4 years' experience; working drawings, details, general work, assist with quantities, good tracer, colourist. Good references. Salary, 25s.—Box 1299, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT'S IMPROVER (20) desires Engagement. Working drawings, small details, good draughtsman, &c. Small salary.—R. R. H., 6, Cromwell Road, King's Lynn. 1294

BUILDER'S ASSISTANT requires ENGAGEMENT. Ten years' experience; take charge of office; thoroughly conversant whole routine; take off quantities; draughtsman, adjustment of contracts; excellent references.—B., St. Albans, Winchester Road, Basingstoke. 1329

BUILDER'S WORKING FOREMAN seeks permanency in private or jobbing firm in London district. Well up in all branches, plans, and details. Trade, bricklayer. Good references. Abstainer. Aged 30.—Wood, 80, Selwyn Avenue, Higham's Park, N.E. 1269

CARPENTER, JOINER, STAIRHAND; piece or day, or as Working Foreman.—J. E. PLASTERER, clean workman; piece or day; abstainers; town or country.—A. E., 84, Cambourne Road, Southfield, Wandsworth. 1320

CLERK of WORKS or GENERAL FOREMAN disengaged; practical and reliable; experienced in all classes of public and private works; good references; town or country.—C. W., 53, Portland Road, Notting Hill. 1304

CRANE or ENGINE DRIVER FITTER, take charge of plant, thoroughly experienced; young man seeks situation.—F. W., 1a, Comboss Road, White Post Lane, Victoria Park. 1276

ESTATE OFFICES, ARCHITECTS, SURVEYORS.—Young Gentleman well up in Planning, Surveying, Levelling, Quantities, and Specifications, desires permanency. Experienced in General Management and Estate Development. A.I.S.E. and A.R.S.I.—Box 1311, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

FOREMAN of JOINERS seeks situation with a firm which turns out first-class work. Accurate setter out. Good references.—Chaseley Villa, Langton Road, E. Molesey. 1313

GENERAL FOREMAN or CLERK of WORKS, shortly disengaged, seeks RE-ENGAGEMENT, experienced in all branches. Reliable and accurate setter-out; good references; wages moderate; aged 48.—Box 1284, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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GENTLEMAN with considerable commercial experience desires ENGAGEMENT on Staff of Merchant or Manufacturer. Fully qualified for position of confidence and responsibility, secretarial duties, or charge of a London office.—L.F.S.H., BUILDERS' JOURNAL, 6, Great New Street, Fetter Lane, E.C. 1322

MACHINIST wants JOB, can work Tenon, Mortice, and Planing Machines, Rise and Fall, and Saw Benches; good cutter out of Joiners' work; good references. Town or country.—G. L., 30, Cottisbrook Street, Woodpecker Road, New Cross, S.E. 1317

MACHINIST (24), spindle hand improver; can also work saw bench, band saw, overhead and panel planer; make cutters, sharpen saws.—MACHINIST, 18, Lausanne Road, Peckham, S.E. 1266

MASON FOREMAN seeks RE-ENGAGEMENT; quick setter out; good manager; 15 years' experience; first-class references.—Box 1309, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

OUTSIDE GENERAL or WORKING FOREMAN seeks SITUATION with Builder; carpenter and joiner by trade; well up in all branches; good references.—POWELL, 15, Walters Road, South Norwood. 1319

PAINTING, DECORATING, &c. Good work on reasonable terms. Town or country. Estimates given on the shortest notice.—YOUNG AND LAWRENCE (Painters to the Trade), 28, Prairie Street, Queen's Road, Battersea. 1295

PLUMBER, GAS and HOT WATER, seeks Situation. Well up in Jobbing and Estate Work. Able to take charge; can fill up time Painting. Abstainer.—M. M., 167, Griffin Road, Plumstead. 1327

PLUMBER (R.P.).—Gas and Hot Water Fitter, first-class all-round hand, wants work day or piece.—C., 4, Blake Terrace, Lynton Road, Gravesend. 1307

SURVEYING ASSISTANT, 12½ years' experience; competent to develop estates, surveying, levelling, and architectural work; specifications and quantities.—Box 1310, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

TO QUANTITY SURVEYORS.—JUNIOR ASSISTANT requires Engagement; abstracting and billing.—Box 1323, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

TO ESTATE and PROPERTY OWNERS. A thorough practical Speculating Builder, who has covered large estates, desires the management of an estate. Superintending and carrying out any class of building, alterations or repairs. Would cover an estate for freeholder with large or small property on arranged terms, undertaking to give all services usually rendered by a builder.—C. F., Springfield Cottage, Horn Lane, Acton, W. 1280

WANTED appointment in office by young Junior ARCHITECT and SURVEYOR; age 23; good experience; excellent references. Sal. £1 to 25s. per week.—Box 1303, BUILDERS' JOURNAL Office, 6, Great New Street, E.C.

WANTED by young man (32), MANAGEMENT of ESTATE, 14 years' varied experience; excellent references; moderate salary for permanency, or would act as builder in development of an estate.—Box 1324, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

Appointments Vacant.

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ADVERTISER wishes to know of person who will prepare Perspective at home in connection with Drawing Office; must be first-class man. Moderate charges.—Box 1328, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

CARVERS (Soft Stone).—WANTED GOTHIC HAND.—M. WHITE, Carver, Peterborough.

SURVEYOR (F.S.I.) requires PUPIL; small premium.—H. S. W., 94, Queen Street, Maidenhead.

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DESIGNS for SUBURBAN RESIDENCES prepared to suit clients. Plans and Specifications for new work and alterations. Drain, Plans at specially low fees.—J. LAWRENCE, jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W.

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HOSPITALS and SCHOOLS.—EXPERT ASSISTANCE offered on designs. Highly successful in competitions. Moderate speculative terms.—G. B., "Woodlands," Ryde, I.W. 1318

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BUILDERS' AUCTIONEERS and DECORATORS' BUSINESS for SALE in the West of England. 80 years in same family. Average turnover £3,500 a year.—Box 1285, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, London, E.C.

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BRICKWORK (with or without plant, any quantity), PLASTERING (with or without material and plant), Joinery, and General Carpenter's Work wanted by practical men. Any distance.—ALLEN BROS., The Dendels, Latham Road, Twickenham.

BUILDERS' JOURNAL, Vols. 11 to 13, 15 to 20 complete in parts, as new. Offers either single volumes or lot to—R. H. ORCHARD, 22, Oakfield Road, Downs Road, Clapton, N.E.

CHURCH SEATING FOR SALE. Tenders are invited for the removal of a large quantity of varnished deal seating, of comfortable pattern and in good condition; a rostrum and other fittings, which are at present at the London Road Chapel, Greenwich. Specification, forms of tender, and full particulars may be obtained from J. F. BULL, Surveyor, 52, Bedford Row, W.C.

MARBLE and GRANITE WORK. Speciality, Shopfittings, Steps, and Monuments.—KELLY & Co., Masons, Mill Hill, N.W., also Kilburn N.W., and Harpenden, &c. Telephone, 1759 Hampstead.

POLING BOARDS, selected lengths and thicknesses (best quality and full measure).

Also Scaffold Boards, Putlogs, Scantlings, Deals, Battens, and Boards. Lowest wharf prices.

C. H. GLOVER & Co., Ltd., Importers, Hatcham Saw Mills, Old Kent Road, S.E.

SAWN OAK PARK PALING, 6 inches wide, 4s. 100 ft. run.—MAY and BUTCHER, Timber Merchants, Heybridge, Maldon, Essex.

TO BUILDERS and HOUSEBREAKERS. Wanted, old Lead Roofings, Gutters, Pipings, &c. Contracts entered into for regular deliveries.—Send particulars and prices to J. A. FULLILOVE, Market Harborough.

YOUNG ARCHITECT wishes to join another or artist, to share apartments, near City.—Particulars and lowest terms to Box 1316, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 11.
August, 1905.

PARLIAMENT AND FIRE-PROTECTION.

ROYAL Assent was given to the Building Act Amendment Act of 1905 at the close of the session. The Act only deals with the question of escape from fire which formed the portion known as Part VIII. of the original Bill put forward by the London County Council. For reasons that it would be too lengthy to refer to here, all the other part of the original Bill presented was thrown out, including also certain fire-protective clauses which were of a constructional character, and which it had been anticipated would be dealt with at the same time as the Fire-escape clauses. It is to be hoped that the constructional fire-protective clauses will be brought before Parliament next session, as it is only with the aid of these or similar measures that it will be possible to reduce the fire risk of the Metropolis.

That that part of the Bill dealing with the escape from fire should have obtained Royal Assent as a separate Act is of course a step in the right direction. Although property owners appear to think that there will be a great hardship in meeting the requirements of the new Act, we anticipate that in actual practice the improvements will by no means be as serious or as vexatious as they anticipate, for the Act as it stands is sufficiently elastic, and there is, further, the usual method of referring to the Tribunal of Appeal, which should satisfy the most carping of critics.

It is our intention in a future supplement to deal with this Act at some length, but at the present moment we would only mention that the question of escape from fire as set forth in the Act not only refers to new buildings but is retrospective and deals with existing buildings. The great principle of retrospective legislation has been applied, and we think wisely applied in this case; and although many vested interests are naturally touched upon by such retrospective legislation, it is for the benefit of the Metropolis that such enactment should have been put on the Statute Book.

A feature of the Bill is the revision of the schedule of fire-resisting materials; this shows considerable improvement upon the existing schedule, but we think it will still require considerable modification upon a future occasion if it is to meet the results of actual experience and investigation. We think that all who were so actively engaged in the promotion of this section of the London County Council's Bill should have the congratulations and thanks of the community, for there are few measures that are of so much direct benefit to the welfare and safety of the community as the Amendment Bill which has just been passed.

THE INSURANCE OFFICES AND REINFORCED CONCRETE.

THE insurance companies as represented by the Fire Offices Committee have issued a guide to those using reinforced concrete, which practically means that the insurance companies have specified the conditions under which they will accept the risk of reinforced-concrete buildings from the fire point of view. While so much has been heard of this system of construction and its advantages, it has yet been apparent to those interested in fire-protection that there are certain grave risks in the application of reinforced concrete from the fire point of view, and although legislation has so far done nothing in the direction of safeguarding the owners and occupiers of buildings so constructed, it is only a question of time until special Bills must come into force on this matter.

In France and in the United States the rudiments of fire-prevention have been sinned against in the most callous manner by the firms connected with reinforced-concrete work, and it is we think only due to the propaganda in Great Britain on this point that more attention has been paid to this matter of late both in the United States and on the Continent. Notable warehouses in this country erected of reinforced concrete are distinctly of a very dangerous character, for the simple reason that the metal-work is not sufficiently protected by the concrete covering, and thus must be affected by heat and practically result in collapse if their contents were to get well alight.

With the new fire-insurance companies' rules, we think the metal-work in reinforced concrete will be suitably protected. We think that with the advent of the Fire Office Rules the ferro-concrete manufacturers will realize that the fire question will have to be seriously considered in this country, and the moment they thoroughly realize this, as has already been the case with one or two individual firms, the only one remaining disadvantage of the general application of reinforced concrete will be swept aside. It is in the interests of the reinforced-concrete constructors, in the interests of our cement industry, and in the interests of economical building that reinforced concrete should not be associated with any such disadvantage as that of neglect in respect of fire-resisting qualities, and all those interested in the advent of reinforced concrete must thus appreciate the fire offices' requirements and see in them a matter for congratulation.

As to the tenour of these rules, we present them in extract, and at the same time we think we should indicate at this point that

one of the leading French firms is at the moment preparing to demonstrate at the London testing station the fire-resistance of a reinforced-concrete floor if constructed in accordance with fire-protective requirements, the fire-test being with a floor measuring 15ft. by 22ft.

Rules as to Reinforced-concrete Construction.

Buildings constructed with concrete reinforced in every part with embedded metal rods, or bars spaced not more than 12ins. apart securely connected or overlapping at least 6ins. at all abutments and intersections, having also bands or bars across the thickness of the concrete, may be deemed of standard fire-resisting construction, provided they conform to the ordinary fire-office rules with the following modifications:—

Rule 3. Concrete may be composed of sand and gravel that will pass through a $\frac{3}{4}$ in. mesh, or of the other materials mentioned in the rule, but in any case the cement used must be Portland (equal to the British standard specification of December, 1904) in the proportion of 6 cwt. of cement to each cubic yard of concrete. The concrete must be thoroughly mixed both dry and wet, and must be rammed round the metal-work in position, every part of which must be completely enclosed with solid concrete.

Rule 4. No external wall to be less than 6ins. and no party-wall less than 13ins. thick in any part.

Rule 7. Flues may be built of reinforced concrete as described not less than 4ins. thick, if lined throughout with fireclay tubes not less than 1½ins. thick. No timber or wood-work to be in contact with such flue.

Rules 10 and 11. Floors must be constructed of reinforced concrete as described not less than 5ins. thick in any part without woodwork bedded therein, supported on beams and columns of similar reinforced concrete.

Rule 13. Roofs must be constructed in a similar manner to floors, the concrete in no part to be less than 3ins. thick.

Rules 14, 15 and 16. All structural metal-work must be embedded in solid concrete, so that no part of any rod or bar shall be nearer the face of the concrete than double its diameter; such thickness of concrete must be in no case less than 1in., but need not be more than 2ins.

Rule 22. Fireproof compartments in connection with reinforced-concrete structures must also be of reinforced concrete as described, with walls not less than 9ins. and floors not less than 5ins. in thickness.

Rule 18. Enclosure to staircase and hoist, if of reinforced concrete as described, may be 6ins. in thickness.

FIRE TESTS IN GERMANY.

By F. JAFFE, Crown Architect, Berlin.

(Free Translation from the German.)

At no time during the world's history has the battle for existence and possession been greater than it is to-day. Countless inventions are placed upon the market yearly, bringing with them innumerable dangers of a nature unknown or undreamt of by those who preceded us. Thus advanced civilization for the time being has to offer sacrifices, and the victims of electrical high-tension systems and of automobilism are our daily offerings to progress.

And yet genius strides through the world of to-day filling it with life and energy, and we who live in this twentieth century should be filled with pride and joy that we live in an epoch which aims at helping the needy, both morally and physically, to live a more useful and healthy life.

At no time in history has the sun of altruism shone as brightly as at present. The uniting of whole classes against a common enemy has never reached so high a standard as at the present time. Our aims generally are good and noble, and are to be commended more than ever, when the ideal and the practical stand on the same ground.

At the present day the protection of our neighbour against the dangers of fire is one of the important tasks of a civilized State, and in all countries of the world which claim to take part in the work of the civilization of humanity many busy and earnest men are making this their life-work. All are called to aid in a battle against the common enemy "fire," an enemy that lays waste our homes, our business premises, our beautiful buildings which adorn our cities, our factories, our theatres and our places of worship.

"Si vis pacem, para bellum!" (If you wish peace, be prepared for war!) Never was this Roman watchword more true than to-day, and it is only by increasing our methods of fire-prevention that we may hope to triumph. We must neither cease nor flag, for dangers come upon the scene in the shape of new inventions which must first be proved, and the necessity to test and test again our fire-preventive weapons becomes more imperative each day.

The efforts which were commenced in Germany to test the safety from fire of building construction date back some twenty years. The first scientific and practical tests on a large scale took place in Munich in 1885, Berlin followed in 1893, and Hamburg in 1895. Further tests and experiments have recently taken place in Berlin and other places in Germany. All these tests aimed at obtaining materials and systems of construction to prevent fire and keep it within bounds. They also aimed at assisting to prepare building regulations and to improve existing ones. Charlottenburg, near Berlin, the centre of these tests, has now become the Technical Research Laboratory (recently transferred to Lichterfelde), whilst the recent work of similar institutions which exist in Munich, Karlsruhe, Leipsic and Stuttgart should not be overlooked.

A historical description of the individual tests is perhaps the best way to illustrate the gradual building up of German testing work and the results obtained.

Tests in Munich, 1885.

These tests, conducted under the direction of Professor Bauschinger of the Technical High School in Munich, were carried out with a view to ascertain whether cast-iron or wrought-iron supports were to be recommended as a durable construction, from a fire-safety point of view. These tests must be described as laboratory tests, but they were carried out in a most scientific manner.

The work under observation was:—(1)

Wrought-iron columns, (2) cast-iron columns, (3) pillars or uprights of hard-burnt bricks in cement. The tests were conducted in such a manner that the iron columns were laid lengthwise in an iron bed of fire, and the variations which took place in length and breadth were registered by means of apparatus erected at the side. The iron columns were then heated to 300 degs. and then to 600 degs. C., the temperature at which red heat commences. Water was then applied from the opposite side, as they become red-hot, in order to bring any cracks into prominence. Alloys (globules) were used to measure the temperature, which, according to experiments made, have the following melting points:—

1 of tin to 2 of lead	= 300 degs. C.
9 of lead to 1 of silver	= 400 "
3 of lead to 1 of silver	= 500 "
6 of lead to 4 of silver	= 600 "

The twelve tests which took place one after another on this occasion showed that wrought-iron columns, even under the most favourable circumstances, begin to bend under their weight at not quite 600 degs. C.; in any event, when they become red-hot bending is assisted and hastened by the application of water from the opposite side. No actual breaks or cracks were reported in connection with these wrought-iron columns; their power of resistance under heat was, however, proved to be practically destroyed.

The cast-iron columns showed a tendency to bend towards the fire, which was increased by the application of water from the opposite side, but this bend did not exceed a certain limit, and the column did not cease to carry a load even when cracks made themselves apparent. As they cooled they became almost straight again.

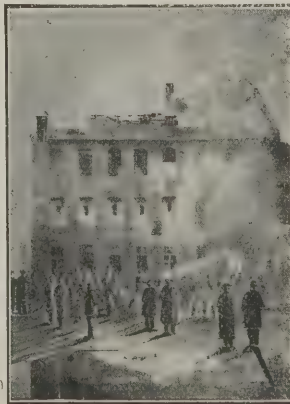
The supports which came out the best in these tests were those made of concrete, Portland cement being used. These absolutely resisted a fire of an hour and three-quarters.

An equally good test was obtained with bricks of cement-mortar, where only the plastering suffered.

The worst tests were those obtained with natural stones, such as sandstone, limestone, which became soft; argillaceous stones, which diminished and lost their power of holding together. No natural stone showed itself so proof against fire as Portland-cement concrete.

Fire Tests in Berlin, 1893.

In connection with the German Accidents Exhibition, held in Berlin in 1889, the Exhibition Committee had placed at their disposal by the Union of German Fire Insurance Companies a sum for prizes, to be spent in awards for specially good results in the sphere of fire-protection. In 1887 a terrible catastrophe occurred in connection with the fire which took place at the warehouse of the Berlin Warehousing and Forwarding Company. It therefore became



THE FIRST FIRE TESTS IN AN OLD BUILDING AT BERLIN (1893).

imperative to think of some means by which such fires could be avoided. The points to be considered in this connection were:—(1) Apparatus and arrangements for the prevention of fire; (2) materials and systems of construction which would lend themselves to the limitation of a fire; (3) appliances for the extinction of fire.

The testing of materials and systems of construction, as indicated in item No. 2, was of the greatest importance, and the jury appointed for these tests therefore decided that these trials should be as much in accordance with reality as possible, and that the competing fire-resisting ceilings, floors, staircases, doors, &c., should be built into a building which had to be shortly pulled down.

The different rooms of the structure tested were therefore fitted up as petroleum stores, drug shops, carpenters' shops and living rooms. In some of the rooms a large amount of timber was stored, which shortly before setting fire to the house was saturated with petroleum. For registering temperatures metals and alloys were used, which were applied to different points such as the ceilings, the floors and the protection around the iron columns. They were as follows:—

Cadmium with a melting point of - - - -	315 degs. C.
Zinc with a melting point of - - - -	412 "
Aluminium with a melting point of - - - -	620 "
800 of silver to 200 of copper - - - -	850 "
Pure silver - - - -	954 "
400 of silver to 600 of gold - - - -	1,020 "
800 of silver to 200 of platinum - - - -	1,190 "
400 of silver to 600 of platinum - - - -	1,460 "

In addition, "Seeger's melting cones" were used, with melting points of from 900 degs. to 11,410 degs. C.

The fire tests showed that the temperatures in the rooms destroyed by fire varied between 100 degs. to 1,300 degs. C., whilst the temperatures under the floors and between the iron columns and stanchions, and their respective protective coverings, always remained under 315 degs. C.

In order to test the durability of certain constructions when exposed to blows and sudden concussion, iron bars were used which rested free on wood supports and fell gradually as the wood burned away.

The above-mentioned tests took place under the direction of the late Chief Officer Stude, of the Berlin Fire Brigade, and his fire inspector, Reichel (now chief of the fire brigade in question), and representatives of the municipality, of the police and the fire insurance companies were present.

With each object the time it was under fire, the temperatures reached, and its state after the fire were recorded.

To go into detail as far as these tests are concerned would be impossible here, but the first prizes were awarded to the Aktien-Gesellschaft für Monierbauten, Berlin; the Gypsum Slab Manufactory of A. & C. Mack, in Ludwigsburg (whose partition slabs were afterwards made in England by Messrs. King & Co.), and to C. Schubert, in Breslau; whilst a number of diplomas were awarded to other well-known manufacturers.

Tests in Hamburg, 1895.

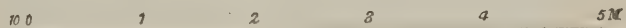
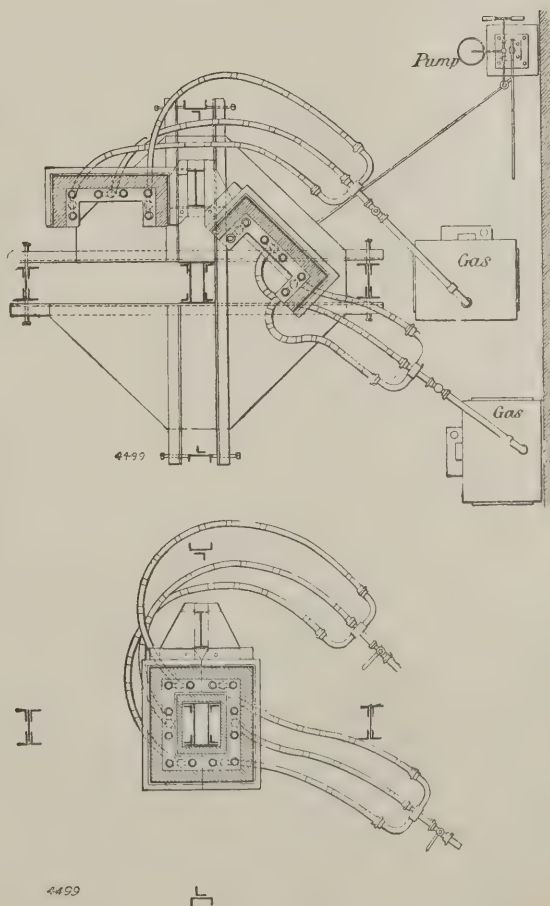
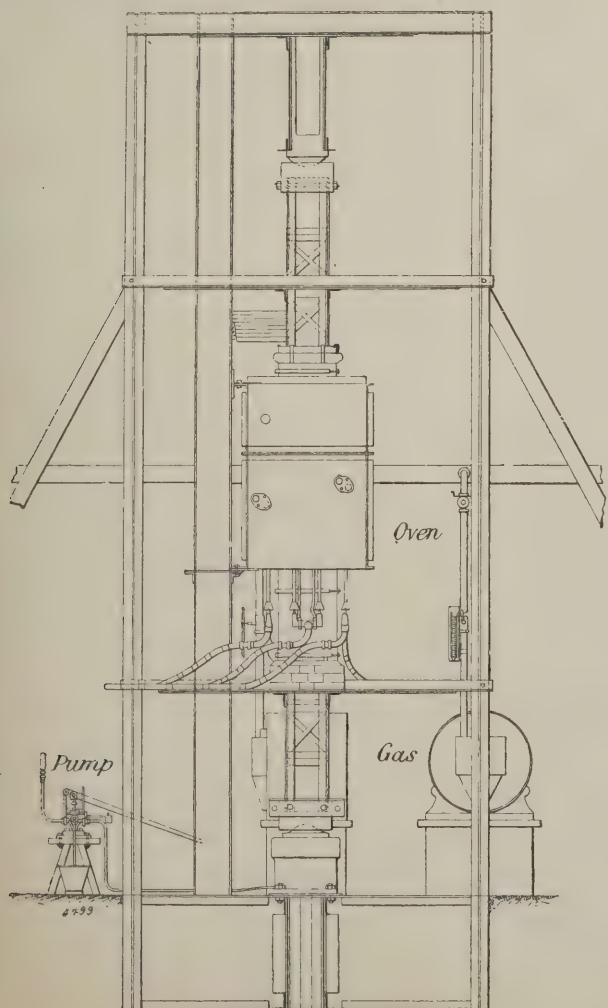
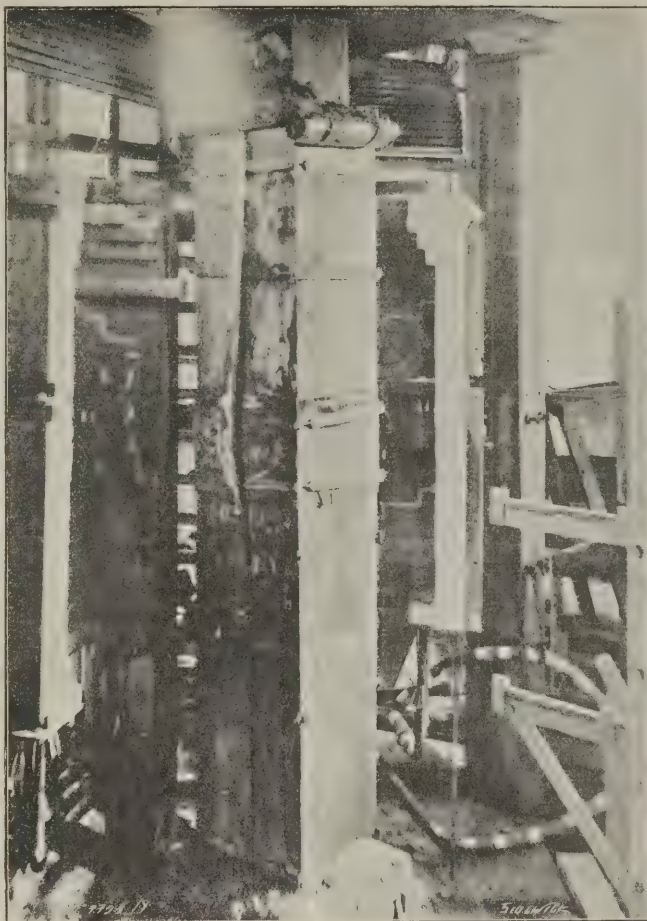
These tests were made in connection with the fire which took place in the warehouses situated near the docks in Hamburg, and the question was whether the principle of wrought-iron stanchions inside a building should be abandoned. The decision was in favour of maintaining the wrought-iron stanchions, but a fire-resisting protection was considered absolutely necessary, that the whole building may not be endangered owing to the failure of individual metal

supports. Another question raised in connection with these tests was whether the spaces between light lattice-girders or stanchions should be filled with cement so as to withstand the fire better. The question was decided in the negative.

It was necessary that the constructions tested should be the same, and that the load and tension should also be approximately the same as those in actual use. It was suggested to heat the columns by means of coke and wood firing, but gas was eventually used, as it enabled a better regulation of the temperature. As the protective covering to the iron proved so efficient against the melting of the metal, some experiments were also made with wooden supports of pine and oak with an outer covering.

The vertical supports were surrounded by an oven half their height, which had four burners on each side. The temperature was taken by means of a pyrometer put inside the oven, whilst a hydraulic press with a manometer indicated the pressure to which the column was submitted. At these tests the alterations which took place in the length and breadth of the columns were taken by means of appliances fixed on the sides of the columns, but independently of them.

In order to ascertain the exact effect which a protective covering had on the durability of the columns, the supports in question were surrounded by fire-resisting materials such as gypsum boards, xylolith plates, wood and sheet-iron plates, "cork-stone" and pumice asbestos plaster. All these materials were fitted in the shape of protective slabs built round the supports. The effective value of certain of these protective coverings was proved in these tests. Such coverings kept the fire from the iron construction in various ratios and protected the ironwork from blows and other disturbing influences.



TEMPORARY PLANT FOR TESTING STANCHIONS AT HAMBURG.

The tests with wooden supports showed that pinewood is more inflammable than oak, and that covering it with sheet-iron proved of use. The fact that wood only chars to a certain depth under fire led to the at that time surprising result that, under certain circumstances, wooden supports possess a far greater power of resistance against fire than unprotected iron ones, as the latter melt or bend and collapse under their load.

The Royal Technical Research Laboratory, Charlottenburg, Berlin.

The buildings in which the Berlin Institute originally made its name were erected in the year 1884 on the construction of the new buildings of the Technical High School, in Charlottenburg, near Berlin, and they were equipped with the most modern appliances and requirements for testing different materials.

The testing station is a public institution, supported by the state, and in addition to a director has a working staff of about 100 men. It is divided into four departments, each having its own superintendent; one of these departments is devoted to the examinations of building materials, and is entrusted with the fire tests. In this department constructional work can be tested in respect to strains, deflection, stability, breaking points and other technical qualities. The choice of test is on the whole left in the hands of those wishing to have material tested, but the Institution is always ready to assist those wishing to test and to advise them to their best advantage. A certificate of test is issued with each test and contains detailed criticism of the building material. It is usual to make several tests with the same material in order to obtain an average result.

Fire tests now form a prominent feature of this department for the examination of materials, and are mostly conducted in detached huts standing in the open or in specially-prepared stoves. The fuel used is wood, the huts erected have an area of about four square metres, and attached to them is a space set apart for observations, which is separated from the hut by a fire-resisting partition. Both spaces have a door leading into the open. The testing hut has openings for the introduction of pyrometers, and is supplied with a chimney. So-called laboratory tests are rarely undertaken by the institution. They are refused because the result of such small tests brings about unreliable results.

For the better observation of the material during and after the test it is preferable that it should be isolated rather than surrounded, as in the latter case it can only be observed by means of small openings. For the measurement of temperatures "Seeger's burning cones" have long been in use. These are hung free in small porcelain saucers in the midst of the fire. Their effectiveness, however, depends on the rapidity in the rise of the temperature. Sometimes they expand, and do not melt at the desired temperature; one is therefore compelled to have recourse to metal alloys. At the more recent tests undertaken by the Institution, the Le Chatelier's pyrometer has been used, the working of which depends on the thermo-element, the joints being platinum and platinum-iridium. The current produced by the heat is measured by means of a galvanometer made by Messrs. Siemens & Halske, Berlin. The appliances themselves are tested for their correctness at the Physical-Technical State Laboratory in Berlin. The testing laboratory in Berlin does not insist upon the automatic registration of the variations in temperature, as is the custom with the British Fire Prevention Committee.

Owing to the very numerous requests for tests by municipal authorities and private individuals, the accommodation of the Berlin Institution became insufficient, and it has

lately been moved to a new building in Lichterfelde, near Berlin, which is built in accordance with the latest and most advanced views so as to be able to adequately deal with the tests to be undertaken.

The experiences gained by the tests in Berlin and Hamburg led the Technical Research Laboratory to institute a number of fire tests with unpatented materials, *i.e.*, non-proprietary work, at the instigation of the Royal Berlin Police. Recent tests have dealt mostly with cement, plaster, &c., in the form of walls and ceilings for inner decoration, but fire-resisting wired bricks and various limestones have also been included. All these tests were conducted in the huts before described.

The Berlin Fire Exhibition and other Tests.

With the assistance of the officers of this laboratory a number of tests were undertaken at the International Fire Exhibition in Berlin in 1901. Here, as in earlier experiments, ceilings and partitions showing a combination of metal and concrete (cement or plaster) were mainly under consideration.

Karlsruhe Tests, &c.

Similar experiments were carried out in Karlsruhe in 1903 with wood and stone stairs, doors, asbestos, piers of brickwork, plaster-boards and cork sheets, wire-glass and impregnated wood. Similar experiments were also carried out in Leipsic, Munich and Stuttgart with ceilings, plate-glass and electro-glazing.

Conclusion.

Fire prevention has made great strides in Germany. A number of excellent inventions have been introduced, and these have been carefully and scientifically investigated and independently tested. The interest awakened is very great; new industries have sprung up, and municipalities, insurance companies, fire-brigade associations, architectural and engineering societies are all taking their share in the work.

I consider that the results of these experiments have been of the greatest possible influence and benefit to our German building regulations. I consider that the tests that have been undertaken have materially assisted in the reduction of the risk of fire in many of our buildings, and that with the aid of the results of these tests and with future investigation of a like character we can look upon the future development of fire-prevention and the safety of life and limb with greater equanimity than before.

I consider that the tests which have now been conducted for some twenty years in Germany have not only been of benefit to Germany but of considerable benefit to other countries, inasmuch as the recognition accorded to earlier scientific experiments conducted in Germany led to these investigations being taken up in other countries. Germany is proud that in scientific research work of this kind she works hand in hand with other civilized countries, united in the unanimous endeavour to protect life and property from fire.

The fight which is now being made in all countries against fire is rapidly growing, and a continuous interchange of information and results should hence be encouraged between the different countries.

It is well that in this age of political ambitions and strife there should be an international centre, where mutual work can be carried on peacefully for the benefit of humanity and the benefit of all nations, such as we see to-day in London in the British Fire Prevention Committee's organization, a centre which bids fair to become a permanent international institution.

Mr. Ellis Marsland, district surveyor, has been elected an hon. member of the Luxembourg Fire Service Union in recognition of his work in the interests of fire-prevention.

CHICAGO'S NEW BY-LAWS.

Extracts from the new Building Ordinance adopted by the City of Chicago on March 13th, 1905.

Classification of Buildings.

53. (Buildings.—Classes of.)—All buildings (other than sheds and shelter sheds, as herein-after described) now existing or hereafter constructed, altered or enlarged within the city shall be classified as follows:

54. (Class I.)—In Class I. shall be included every building used for the sale, storage or manufacture of merchandise, other than department stores, as described in sections 60 and 70 of this ordinance, and all stable covering or occupying a ground area of over 500 sq. ft.

55. (Class II.)—In Class II. shall be included every office building, hospital and every building used for hotel purposes or for boarding or lodging-house purposes where such building so used for hotel or boarding or lodging-house purposes is occupied by twenty or more persons.

56. (Class III.)—In Class III. shall be included every building used as a family residence, also every building used for stabling purposes where such building so used shall occupy a ground area of less than 500 square feet.

57. (Class IV.)—In Class IV. shall be included every building used as an assembly hall, whether such hall is used for the purpose of worship, instruction or entertainment, unless such building is used for any of the purposes for which buildings of Class V. or Class VIII. are used.

58. (Class V.)—In Class V. shall be included every building which is used as a public theatre where an admission fee is charged and in which movable scenery is used; provided, however, that public halls and club halls with a seating capacity of less than 600, although occasionally used for theatrical representations, shall not be constructed to be public theatres within the meaning of the term as used in this section, notwithstanding the fact that movable scenery is used upon the stage therein on such occasions, and such public halls and club halls shall not be considered as buildings of Class V. as herein defined. Such public halls and club halls shall be included in Class IV. as defined in sections 57 and 400 of this ordinance.

59. (Class VI.)—In Class VI. shall be included every tenement and apartment house; that is to say, any house or building or portion thereof, which is used as a home or residence for two or more families living in separate apartments.

60. (Class VII.)—In Class VII. shall be included all buildings used for the sale at retail of dry goods and other articles of general merchandise and commonly known and described as "department stores."

61. (Class VIII.)—In Class VIII. shall be included every building used exclusively for school purposes.

62. (Buildings used for the Purposes of more than One Class.)—Where any building is used for the purposes of two or more classes as herein specified and defined, such portion of any such building as is devoted to the uses and purposes of any particular class shall be constructed, operated and maintained in accordance with the requirements of this ordinance relating to such class, unless such construction shall prove impracticable or unless there would be a conflict between the provisions of this ordinance relating to the construction of buildings; in either of which such cases the provisions relating to and governing the construction of buildings of the class requiring the best and safest form of construction shall govern.

63. (Conflict between Special and General Provisions.)—Whenever any provision or requirement of this ordinance relating specifically to the construction, equipment, maintenance or operation of any building or part of a building used for the purposes of any specified class shall conflict with the general provisions of this ordinance relating to the construction, operation and equipment of buildings generally, the special provisions shall govern in each case.

102. (Buildings.—Height and Construction of.)—Buildings of Class I, which are roof or more in height shall be built entirely of fireproof construction.

Buildings of Class I, less than roof, and more than 60ft. in height shall be built entirely of slow-burning, mill or fireproof construction.

No building of Class I, more than five storeys in height shall be permitted to be built of ordinary construction.

104. (Walls.—Metal, Lath and Solid Cement Plaster Covering.)—A one or two-storey building used for the purposes of Class I, no part of which is within 20ft. of any lot line, alley line or street line, having a complete self-supporting steel-frame consisting of wall columns supporting steel trusses, with steel trusses and steel diagonals designed to resist safely within the safe limits of stress provided by this ordinance a wind-pressure of 30 lbs. per square foot for each and every exterior surface exposed to the wind, in addition to the dead weight of the completed structure, and in addition to the live load of 100 lbs. per square foot provided for by this ordinance, and any other live loads which may be imposed on said structure, may have exterior walls measuring not less than 1 1/2 ins. thick of metal, lath or metal fabric plastered on both sides with a mortar consisting only of Portland cement and torpedo sand. A complete reinforced concrete framework built in every manner equally as strong and as safe as provided for a steel frame in this section may have exterior walls built in the same manner of the same materials and of the same thickness.

202. (Buildings.—Construction of.—Height of.)—Buildings of Class II, which are roof or more in height, shall be built entirely of fireproof construction.

Buildings of Class II, less than roof, and more than 60ft. in height shall be built entirely of slow-burning or mill or fireproof construction. Buildings of Class II, not exceeding four storeys in height and less than 60ft. in height may be built of ordinary construction.

General Provisions for Fireproof Construction.

900. (Fireproof Construction.)—In cases in which it is claimed that any equally good or more desirable mode or manner of construction, or material, or device for fireproofing other than specified in this ordinance can be used

in the erection or alteration of buildings, the commissioner of buildings, upon written application to him for a permit to use the same, shall have power to appoint a board of examiners consisting of not less than three nor more than five members, each of whom shall have had at least ten years' experience in Chicago as an architect, engineer or builder, who shall take the usual oath of office. The said examiners shall adopt rules and specifications for examining and testing such mode or manner of construction, or material, or device for fireproofing, and furnish a copy of the same to the applicant. And said specification shall provide for a comparative fire test of not less than four hours and for a period of at least two hours an average temperature of 2,000 degs. Fahr. shall be maintained. At the end of this test water shall be applied to the construction through a $\frac{1}{2}$ in. nozzle under 60 lbs. pressure for five minutes. All expenses of such examiners and of such examinations and tests shall be paid by the applicant, and said examiners may require security therefor.

The said examiners shall, after such examination and tests, certify the results, and their decision on the said application to the commissioner of buildings, who shall have power, in the event of the examination and tests being satisfactory, to grant a permit to the applicant in accordance with such decision of the said board of examiners. A complete record of the proceedings and all acts and decisions of the said board of examiners shall be kept by the commissioner of buildings in his office.

The commissioner of buildings shall have the power to pass upon any question relative to the mode or manner of construction or materials to be used for fireproofing in the erection or alteration of any building or structure to make the same conform to the true intent and meaning of the several provisions of this ordinance.

901. (Fireproof Construction.—Definition of.)—The term fireproof construction shall apply to all buildings in which all parts that carry weights or resist strains, and also all exterior walls and all interior walls and all interior partitions and all stairways and all elevator enclosures are made entirely of incombustible material, and in which all metallic structural members are protected against the effects of fire by coverings of a material which shall be entirely incombustible, and a slow heat conductor, and hereinafter termed "fireproof material." Reinforced concrete as defined in this ordinance shall be considered fireproof construction.

902. (Fireproof Material.)—The materials which shall be considered as filling the conditions of fireproof covering are: First, burnt brick; second, tiles of burnt clay; third, approved cement-concrete; fourth, terra-cotta; fifth, approved cinder concrete.

903. (Concrete—Approved Cement.)—All approved cement-concrete shall consist of a standard Portland cement, torpedo sand, and crushed stone or gravel, or crushed blast-furnace slag, or crushed burnt clay: the volumetric quantity of any one of these materials combined with the torpedo sand shall not exceed nine times the volume of the Portland cement. All of the ingredients of cement-concrete shall be thoroughly worked and wet so as to cover each piece of stone or gravel or slag or burnt clay with moistened cement; and the cement and sand shall fill the voids between the coarse material of the cement-concrete. All cement-concrete to be considered a fireproof material shall be cast and rammed in an unset condition against the metal.

904. (Concrete—Approved Cinder.)—Machine or hand-pressed concrete bricks or blocks are not considered in this ordinance as a fireproof material for the protection of metallic structural members.

905. (Brick, Burnt Clay, Tiles, &c.—How Applied.)—Brick, burnt clay, hollow tiles, porous clay, solid tiles and terra-cotta shall be applied to the metal in a bed of mortar.

906. (Fireproof Covering.—Minimum Thickness of.)—The minimum thickness of fireproof covering on any metal shall be, if of hollow tile, constructed in such a manner that there shall not be less than one air space of at least three-fourths of an inch, by the width of the metal surface to be covered, within the clay covering; if of porous clay tiles, the covering shall be at least $\frac{1}{2}$ ins. thick. The minimum thickness of concrete covering any metal shall be 2 ins.

907. (Incombustible Materials.)—A metal or fire-resisting glass of not less than $\frac{3}{4}$ in. in thickness, or plastering, or plaster blocks, or stone or granite, or marble, or an approved cinder-concrete or one of the fireproof materials described herein shall be considered an incombustible material as called for by this ordinance.

908. (Concrete—Cinder—Floor-filling—Specifications for.)—Whenever the use of a cinder-concrete is permitted by this ordinance, such cinder-concrete shall be composed of the following named ingredients, in the proportion here described, to wit: 5 parts of clean, thoroughly burnt, steam boiler cinders, no particle of which shall be larger than $\frac{1}{4}$ in.; 3 parts of clean grit sand, or other parts of clean stone screenings, and 1 part of a standard Portland cement; the working and wetting of these ingredients shall be done in the same manner as required for cement-concrete in section 903 of this ordinance, and such a mixture of approved cinder-concrete may be used only for floor filling.

909. (Fireproof Covering—Measurements.)—In every case the thickness of the covering specified in this ordinance shall be measured from the extreme projection of the metal, unless otherwise provided herein.

Construction of Fireproof Buildings.

910. (Skeleton Construction.)—The term "skeleton construction" shall apply to all buildings wherein all external and internal loads and strains are transmitted from the top of the buildings to the foundations by a skeleton or framework of metal. In such metal framework the beams and girders shall be riveted to each other at their respective junction points. If columns made of rolled iron or steel are used, their different parts shall be riveted to each other, and the beams and girders resting upon them shall have riveted connections to unite them with columns. If cast-iron columns are used, each successive column shall be bolted to the one below it by at least four bolts not less than three-fourths of an inch in diameter, and the beams and girders shall be bolted to the columns. At each line of floor or roof beams, lateral connections between the ends of the beams and girders shall be made in such manner as to rigidly connect the beams and girders with each other in the direction of their length.

911. (Walls—Enclosing.)—If buildings are made fire-

proof entirely, and have skeleton construction so designed that their enclosing walls do not carry the weight of floors or roof, then their walls shall be not less than 2 ins. in thickness; provided such walls shall be thoroughly anchored to the iron skeleton, and whenever the weight of such walls rests upon beams or columns, such beams or columns shall be made strong enough in each storey to carry the weight of wall resting upon them without reliance upon the walls below them. All walls shall be of fireproof or incombustible material.

912. (Columns—Exterior.)—All iron or steel used as a

vertical supporting member of the external construction of any building exceeding 60 ft. in height shall be protected against the effects of external changes of temperature and of fire by a covering of fireproof material consisting of at least 4 ins. of brick or of 4 ins. of concrete, or of 4 ins. of burnt-clay tiles, or 4 ins. of hollow terra-cotta, or of a combination of any two of these materials, provided that their combined thickness is not less than 4 ins. The thickness of 4 ins. shall be measured from the extreme projections of the metal of the column proper.

Where stone or other incombustible material is used for



VIEWS SHOWING THE EFFECT ON CONSTRUCTIONAL STEELWORK OF A FIRE AT THE BREMEN DOCKS.

the exterior facing of a building the distance between the back of the facing and the extreme projections of the metal of the column proper shall be at least 4 ins., and this 4 in. space shall be filled with one of the "fireproof materials."

In all cases, the brick or burnt clay, tile or terra-cotta, if used as a fireproof covering, shall be bedded in cement-mortar close up to the iron or steel members, and all joints shall be made full and solid.

973. (Fireproofing of Exterior Sides of Mullions.)—In buildings required by this chapter to be of fireproof construction all vertical door or window mullions over 8 ins. wide shall be faced with incombustible material; horizontal transom bars over 6 ins. wide shall be faced with a fireproof or with an incombustible material.

974. (Spandrel Beams, Girders, Lintel.)—The metal of the spandrel beams or spandrel girders, or lintels of exterior walls, which support a part of exterior walls, shall be covered in the same manner and with the same material as specified for the exterior columns in this ordinance. The covering thickness shall be measured from the extreme projection of the metal in every case.

975. (Fireproof Covering Independent.)—All covering of brick, concrete, burnt-clay tiles, hollow terra-cotta or of a combination of any two of these materials shall be applied to all of the structural members of the exterior of a fireproof building previously and independently of the application of the architectural facing of such a fireproof building with an incombustible or fireproof material.

977. (Walls, Support and Fireproofing of.)—Where skeleton construction is used for the whole or part of a building, the enveloping material and the walls shall be independently supported on the skeleton frame for each individual story.

978. (Terra-cotta.)—If terra-cotta or other hollow blocks are used as fireproof covering they shall be backed up with brick or hollow tile or concrete; whichever is used shall be, however, of such dimensions and laid up in such a manner that the backing will be built into the cavities of the facing so as to secure perfect bond between the facing and its backing.

979. (Coping.)—The upper surfaces of all breaks or offsets in external coverings and fillings and walls, as well as the tops of walls, shall be covered with stone, terra-cotta, metal, concrete or fireclay copings set in cement-mortar. Copings of all kinds which do not have lapped joints shall be pointed with mortar composed of 1 part of standard Portland cement and 2 parts of torpedo sand.

980. (Columns—Interior.)—The covering of interior columns shall be one or more of the fireproof materials herein described.

If such covering shall be of brick or concrete it shall be not less than 4 ins. thick; if of burnt-clay tiles, such covering shall be in two consecutive layers, each not less than 2 ins. thick, with one air space; if of porous clay solid tiles, it shall consist of at least two layers no less than two combination of any two of these materials, one-half of the total thickness required for each of the materials shall be applied, of each of such materials. Whether hollow tile, porous tile or terra-cotta is used, the two consecutive layers shall be so applied that neither the vertical nor the horizontal joints in the same shall be opposite each other, and each course shall be so anchored and bonded within itself as to form an independent and stable structure.

In all cases the brick or hollow tile, solid tiles or terra-cotta shall be bedded in cement-mortar close up to the iron or steel member, and all joints shall be made full and solid.

In the case of columns having an "H"-shaped cross-section or of columns having any other cross-section with channels or chases open from base-plate to cap-plates on one or more sides of the columns, then the thickness of the fireproof covering may be reduced to 3 ins., measuring in the direction in which the flange or flanges project, and provided that the thin edge in the projecting flange or arms of the cross-section does not exceed 1 in. in thickness. The thickness of the fireproof covering on all surfaces measuring more than 1 in. wide and measuring in a direction perpendicular to such surfaces shall be not less than that specified for interior columns in the beginning of this section, and all spaces, including channels or chases between the fireproof covering and the metal of the column, shall be filled with a solid fireproof material. Lattice or other open columns shall be completely filled with approved cement-concrete.

922. (Columns—Wiring Clay Tiles on.)—Burnt-clay tile column-covering shall be secured by winding wire around the columns after the tile has all been set around such columns. The wire shall be securely wound around the tile in such a manner that every tile is crossed at least once by a wire. If iron wire is used it shall be galvanized, and no wire used shall be less than No. 12 gauge.

924. (Pipes enclosed by Covering.)—Pipes shall not be enclosed in the fireproofing of columns or in the fireproofing of other structural members of any fireproof building, provided, however, gas or electric-light conduits not exceeding 1 in. inside diameter may be inserted in the outer zincs of the fireproofing of such structural members.

Construction of Fireproof Buildings.

925. (Shafts, &c.)—In cases where a pipe, conduit, dumb waiter, table, wire, conveyor, belt or any combination thereof passes from one storey to another storey through an open hatch or floor opening, a shaft or enclosure of fireproof material shall be built from floor to floor around such hatch or floor opening in each storey above and below such hatch or floor opening in the same manner as described for fireproof partitions in this ordinance. The area of space thus enclosed shall not exceed the area of the hatch or floor opening by more than 100 per cent.

In no case shall any wood be used in the construction or support or fittings of such shaft as described above. If such holes in floors as described above in this section are not enclosed by such fireproof enclosures, then the open spaces in each floor opening not occupied by pipes, conduits, cables, wires, conveyors, belts or any combination thereof shall be filled solid with fireproof material not less than 8 ins. thick.

926. (Shafts, Partitions around, Plastering of.)—All burnt-clay or terra-cotta partitions or walls around shaft having openings in floors shall be plastered on the outside and plastered or pointed on the inside.

927. (Shaft, Doors and Windows.)—All doors, frames, sashes, casings and windows in partitions or walls around floor openings, or around stair shafts or elevator shafts, shall be built of incombustible material. The supports

of such doors, frames, sashes, casings and windows shall also be of incombustible material; in the case of doors such supports shall be of rolled structural metal extending from floor to ceiling and secured to both. Where there are brick walls of 12 ins. or more in thickness the supports need not extend to ceiling as above specified. All glass used in connection with such partitions or walls shall be fire-resisting. Sheet metal work pressed over asbestos paper and wood may be used for the openings in such partitions, except for elevator doors in shafts and where the provisions of this chapter require all metal doors.

928. (Beams and Girders, Coverings of.)—The beams and girders of the interior structural parts of a building shall be covered by one of the fireproof materials so applied as to be supported entirely by the beam or girder protected, and shall be held in place by the support of the flanges of such beams or girders and by the cement-mortar used in setting. If metal binding or metal anchors are used as fastenings of such fireproof covering, such metal binding or such metal anchor shall be protected by not less than 1/2 in. of fireproof covering.

If the covering is of brick it shall be not less than 4 ins. thick; if of hollow tiles or if of solid porous tiles, or if terra-cotta, each of such tiles shall be not less than 1 1/2 ins. thick, applied to the metal in a bed of cement-mortar; hollow tiles shall be constructed in such a manner that there shall be one air-space of at least 1/2 in. by the width of the metal surface to be covered within such clay coverings; the minimum thickness of concrete on the bottom and the sides of metal shall be 2 ins.

The top of all girders and beams shall be protected with zincs of brick or 1 1/2 ins. of burnt clay, or zincs of approved cement-concrete, or 3 ins. of approved cinder concrete. The brick or burnt clay shall be bedded solid on the metal in cement-mortar.

In all cases of beams or girders in roofs or floors, no matter what the material or form of the floor arch used, the protection of the bottom flanges of the beam and girders and so much of the web of the same as is not covered by the arches shall be made as hereinbefore specified for the covering of beams and girders. In every case the thickness of the covering shall be measured from the extreme projection of the metal, and the entire space or spaces between the covering and the metal shall be filled solid with one of the fireproof materials excepting the air-spaces in hollow tile.

929. (Girders and Trusses.)—All girders or trusses when supporting loads from more than one storey shall be fireproofed with two thicknesses of fireproof material or a combination of two fireproof materials as required for exterior columns in section 912 of this ordinance, and each covering of fireproof material shall be bedded solid in cement-mortar.

All other girders or trusses supporting only a ceiling or roof shall be covered with a fireproof covering as specified for beams and girders in section 928 of this ordinance.

930. (Cut-out Boxes, Chases, &c.)—No electric service cut-out box, switch-box, cabinet, chase or any other recess shall encroach on the minimum thickness required for any fireproof covering on structural metal, except as provided in section 924 of this ordinance. If the depth of any cut-out box, switch-box, cabinet or chase, or of any other recess, is to be concealed or partially concealed, then the thickness of the fireproof covering shall be increased correspondingly.

931. (Floor, Construction of.)—Brick, hollow tile, porous terra-cotta, or approved cement-concrete, or approved cinder-concrete, shall be used for the construction of floors and roofs of fireproof buildings. Flat arch hollow tile, or flat arch porous clay tile floor arches shall have a height of at least 1 1/2 ins. for each foot of span.

932. (Hollow Tile Flooring.)—Hollow tile flat arch floor construction having a thickness of only 1 1/2 ins. for each foot of span shall be used only for the minimum floor loads, and the area of burnt clay in the flanges, and ribs and webs of the hollow burnt clay tiles shall be proportioned to the safe value of resistance to compression of the materials used, in the most stressed areas of the burnt clay.

933. (Segmental Arches.)—Segmental arches shall have a rise of at least 1 in. for each foot of span of arch. The least thickness of a hollow tile or porous terra-cotta segmental arch shall be 1 in. per ft. of span, but no such hollow tile or terra-cotta shall be of a thickness less than 5 ins. Both flat and segmental arches shall be so constructed that the joints of the same radiate from a common centre, and there shall be a cross rib for every 4 ins. or fractional part thereof in height in each tile block. The skew-back of the arches shall be carefully fitted to the beams supporting them, and in addition to the cross ribs there shall also be additional diagonal reinforcing ribs in the skew-back. Such arches, whether flat or curved, shall have their beds well filled with cement-mortar, and the centres shall not be struck until the mortar has set. Burnt-clay skew-backs shall be moulded in such a manner as to support the burnt-clay covering on the undersides of beams or girders.

934. (Floors, Wood Surfacing and Nailing Strips.)—Wood-floor surfacing and wooden nailing strips for such wood-floor surfacing may be used in fireproof buildings.

Where wood flooring is used in a fireproof building, the space immediately under such wood flooring and between the wood nailing strips and under such wood-nailing strips shall be filled with a cement or a cinder-concrete tamped into place in an unset state, or such other incombustible material as shall be approved by the Commissioner of Buildings.

935. (Partitions in Fireproof Buildings.)—The partitions around stairs, stair halls, shafts, elevators or public lavatories shall be fireproof partitions, as described in section 936 of this ordinance; all other partitions in fireproof buildings shall be incombustible partitions. Where blocks are used for building partitions or as enclosing walls the joint shall be well filled with mortar.

The partitions shall be wedged tight between floors and ceilings with incombustible wedges.

936. (Partitions, Fireproof.)—Only fireproof material shall be used for fireproof partitions; if of brick, they shall be not less than 4 ins. thick, and if of partition blocks not less than 3 ins. thick. If fireproof partitions are of reinforced concrete they shall be not less than 2 ins. thick. All fireproof partitions shall be supported directly by the steel construction, or by the fireproof-floor arches, or stone-concrete or brick. No cinder-concrete or wood-flooring shall intervene between any such partition and its support. All doors, windows, sashes, frames, cases

and glass in fireproof partitions shall be built as required in section 927 of this ordinance.

937. (Partitions, Incombustible.)—Only fireproof or incombustible material shall be used in the construction of incombustible partitions, excepting that frames, casings, doors, sash and the rough carpenter-work required for the proper fastenings of such frames, casings, doors or sash may be of wood, and that ordinary glass may be used in doors and partition windows.

938. (Stairs, Landings.)—Stairs in fireproof buildings shall be built of approved cement-concrete, reinforced concrete, stone or with metal supports, metal strings, metal treads, metal platforms, or a combination of one or more of such materials. If reinforced concrete is used in the construction of any stairs in a fireproof building such stairs shall be designed according to the provisions of the sections applying to reinforced concrete. Stairs shall carry a live load of not less than 100 lbs. per sq. ft. on treads and landings, and every part of a stair shall be so designed that the safe limit of fibre stress is not exceeded. The handrails of such stairways may be of wood, all other material in such stairways in fireproof buildings shall be "fireproofed" or "incombustible" material, except cinder-concrete. If stairs are constructed of solid concrete, having the tread and riser in one piece, then there shall be not less than 45 sq. ins. of concrete in the cross-section of such combined tread and riser, and such stairs shall have reinforced concrete or metal outer strings. If stone treads or platforms are used they shall have a metal sub-tread, or sub-platform of the same weight as if the metal alone were used. If platforms have a floor arch sub-structure, as described in section 931 of this ordinance, then the metal sub-platform may be omitted.

939. (Painting.)—All structural metal which is used in a fireproof building or which is used in any foundation, or in reinforced concrete work, shall be clean and free of rust or scale at the time of the enclosure or covering of such metal. All metal which is not to be fireproofed shall have two coats of first-class metal protecting paint.

Specification for Reinforced Concrete.

947. (Reinforced Concrete—Regulations in regard to the Use of.)—The term "reinforced concrete" as used in this ordinance shall be understood to mean an approved concrete mixture reinforced by steel of any shape, so combined that the steel will take up the tensional stresses and assist in the resistance to shear.

948. (Stress.)—Reinforced concrete construction shall be of such nature that the stresses can be calculated according to the accepted formulas of modern concrete engineering practice.

949. (Permission to Erect.)—Before permission to erect any reinforced concrete structure is issued, complete drawings and specifications shall be filed with the Commissioner of Buildings showing all details of the construction, the size and position of all reinforcing rods, stirrups, &c., and giving the composition of the concrete.

950. (Concrete—Mixing—Method of Testing.)—The concrete shall be mixed in the proportions of 1 of cement, 3 of sand and 5 of stone, gravel or slag. The proportions shall be such that the resistance of the concrete to crushing shall not be less than 2,000 lbs. per square inch after hardening for twenty-eight days. The tests to determine this value shall be made by a competent engineer under the direction of the Commissioner of Buildings. The concrete used in reinforced concrete construction shall be what is usually known as a wet mixture.

951. (Cements—Method of Testing.)—Only high-grade Portland cements shall be used in reinforced concrete construction. Such cements, when tested neat, shall after one day in air develop a tensile strength of at least 200 lbs. per square inch; and after one day in air and six days in water shall develop a tensile strength of at least 500 lbs. per square inch; and after one day in air and twenty-seven days in water shall develop a tensile strength of at least 600 lbs. per square inch. Other tests as to fineness, constancy of volume, &c., made in accordance with the standard method prescribed by the American Society of Civil Engineers' Committee, may, from time to time, be prescribed by the Commissioner of Buildings.

952. (Sand—Torpedo.)—The sand to be used in such concrete shall be clean, sharp torpedo sand, free from loam or dirt.

953. (Stone—Crushed, Slag or Gravel.)—The stone used in such concrete shall be clean, crushed stone or gravel, or crushed blast furnace slag of a size that will pass through a 1/2 in. ring. The stone shall be fresh broken, and the gravel shall be thoroughly washed.

954. (Steel.)—The steel used shall be calculated according to its elastic limit; for moving or vibrating loads a steel of a lower elastic limit than is used for quiescent loads shall be used.

955. (Reinforcing—Method of.)—All reinforcing steel shall be completely enclosed by the concrete, and such steel shall nowhere be nearer to the surface of the concrete than the diameter of such reinforcing steel bar or rod or other shape. The steel in beams or girders shall be so disposed that there shall be not less than 1 1/2 times the thickness of the steel in concrete between the steel, and, where more than two bars are used, the bars shall be placed in two or more planes.

Reinforced concrete shall be designed that the stresses in the concrete and the steel shall not exceed the following limits:—Extreme fibre stress on concrete in compression, 500 lbs. per sq. inch; shearing stress in concrete, 75 lbs. per sq. inch; concrete in direct compression, 350 lbs. per sq. inch; tensile stress in steel, one-third of the elastic limit; shearing stress in steel, 10,000 lbs. per sq. inch. The adhesion of concrete to steel shall be assumed to be 75 lbs. per sq. inch of surface where bars are 1/2 in. or less in diameter, and proportionately less for bars of a diameter greater than 1/2 in. The ratio of the moduli of elasticity of concrete and steel shall be taken as 1 to 12.

The following assumption shall guide in the determination of the bending moments due to external forces:—Beams and girders shall be considered as simply supported at the ends, no allowance being made for continuous construction over supports. Floor-plates, when constructed continuous and when provided with reinforcement at top of plate over supports, may be treated as continuous beams, the bending moment for uniformly distributed loads being taken at not less than wL divided by 8; the bending moment may be taken at wL divided by 20 in the case of square floor-plates which are reinforced in both directions and supported on all

sides. The floor-plate to the extent of not more than five times the width of any beam or girder may be taken as part of that beam or girder in computing its moment of resistance.

The moment of resistance of any reinforced concrete construction under transverse loads shall be determined by formulas based on the following assumptions:—

(a) The bond between the concrete and steel is sufficient to make the two materials act together as a homogeneous solid.

(b) The strain in any fibre is directly proportionate to the distance of that fibre from the neutral axis.

(c) The modulus of elasticity of the concrete remains constant within the limits of the working stresses fixed in this ordinance.

From these assumptions it follows that the stress in any fibre is directly proportionate to the distance of that fibre from the neutral axis. The tensile strength of the concrete shall not be considered.

956. (Construction—Reinforced Concrete.)—Reinforced concrete construction shall be designed so that the shearing stresses, both vertical and horizontal, developed in any part of the construction shall not exceed the safe working strength of the concrete as fixed in this ordinance, or a sufficient amount of steel shall be introduced in such a position that the deficiency in the resistance to shear is overcome. When the safe limit of adhesion between the concrete and steel is exceeded, some provision shall be made for transmitting the strength of the steel to the concrete.

957. (Columns—Reinforced Concrete.)—Reinforced concrete may be used for columns when the ratio of length to least side or diameter does not exceed 12. The reinforcing rods shall be tied together at intervals of not more than the least side or diameter of the column, or spirally wound steel may be used.

When vertical reinforcing rods are used in columns, such rods shall have their ends milled normal to the longitudinal axis, and such rods shall have full perfect bearings at each joint, and such joint shall occur only at floors or other points; lateral support and a tight-fitting sleeve shall be provided at all joints of vertical reinforcing rods.

958. (Wind-pressure.)—In the case of buildings in which allowances must be made for wind-pressure as provided in section 1013 of this ordinance, the reinforcing rods of columns shall be connected and the milled end surfaces shall be brought together by threading the rods and by threaded sleeve nuts, or threaded turnbuckles, or methods equally effective and satisfactory to the Commissioner of Buildings.

959. (Tests.—To be made by Contractor on Demand.)—The contractor shall be prepared to make load tests on any portion of a reinforced concrete construction within a reasonable time after erection as often as may be required by the Commissioner of Buildings. Such tests shall show that the construction will sustain a load of twice that for which it is designed without any sign of failure, or in the case of beams, girders or floors without deflecting more than $\frac{1}{100}$ th of the span.

960. (Reinforced Concrete Walls.)—Buildings of Classes I., II., III., VI. and VII. having a complete skeleton construction of steel or of reinforced concrete construction, or a combination of both, designed to safely resist all of the strains caused by the dead weights of the structure and of the live loads and of the wind-pressure within the safe limits of stress provided in this ordinance for each material used, may have walls of reinforced concrete 6 ins. thick for the upper two storeys and walls 7 ins. thick for the two storeys next below the upper two storeys, and walls 8 ins. thick for the storeys next below the upper four storeys, and walls 9 ins. thick for the storeys next below the upper six storeys, and so on downwards, increasing the thickness of

the walls 1 in. for each two storeys or part thereof. Provided, however, that such walls shall support only their own weight, and that such walls have steel rods $\frac{3}{4}$ in. in diameter or of an equivalent area set vertically and spaced not more than 18 ins. apart, and steel rods $\frac{3}{4}$ in. in diameter or of an equivalent area set horizontally tied to the vertical rod at each intersection with these and set not to exceed 24 ins. apart, and provided that where the weight of the walls of each storey is not transferred to the skeleton by spandrel beams the vertical reinforcement shall be increased in weight in an arithmetical ratio of twice as much steel in the two storeys next below the upper two storeys and three times as much steel in the two storeys next below the upper four storeys, and so on downward. Vertical bars shall be spiced together by winding with iron wire. Horizontal bars shall be wired to the columns. Additional bars shall be set around openings, the verticals wired to the nearest horizontal bars and the horizontal bars at the top and bottom of openings shall be wired to the nearest vertical bars.

The steel rods shall be combined with the concrete and placed where the combination will develop the greatest strength, and the rods shall be staggered or placed and secured to the steel or reinforced concrete structural skeleton of the building so as to resist a pressure of 50 lbs. per sq. ft. either from the exterior or the interior on each and every square foot of each wall panel.

(To be continued.)

FIRE TESTS.

THE British Fire Prevention Committee undertook a number of important tests with proprietary work on August 16th, which were followed by an experimental test on the Committee's part on August 17th.

The testing operations commenced with a fire-test with a roller shutter of the "Kinnear" type, erected by Messrs. Arthur L. Gibson & Co. across a 9 ft. opening, the test being intended for the purpose of classification as rendering partial protection. This was followed by a test with a partition of 2½ ins. thickness plastered on one side with special plastering, constructed by the National Fireproofing Co. with a view to obtaining classification as affording "full protection." Thereupon there was a test with a porous brick floor constructed by Messrs. Faber & Co., plastered below, also intended for classification under "full protection."

The following were the times of the respective tests and their general outline, but of course the official reports have to be issued still, and pending their issue we cannot give detailed particulars.

The Kinnear door was under test for an hour and a half at temperatures rising to over 1,800 degs. Fahr., followed by the application of water from a steam fire-engine for 2 minutes.

The partition was under test for 2½ hours at temperatures rising to above 1,800 degs. Fahr., followed by the application of water for 2 minutes.

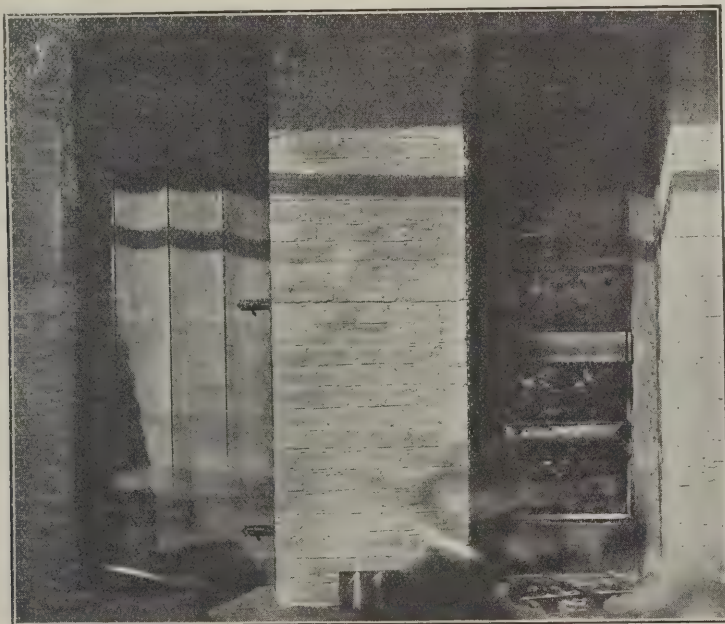
The Faber floor was also under test for 2½ hours at temperatures rising to above 1,800 degs. Fahr., followed by the application of water for 2 minutes.

As to the experimental test, this was with a concrete floor with Skelton broad flange girders as beams; the test was of 4 hours' duration, followed by the application of water for 5 minutes.

THE GILMOUR DOOR TESTS.

The reports issued during the current month by the British Fire Prevention Committee comprise two, referring to tests of general interest—one of the Gilmour Door Co. with two doors, the other in respect to a floor of the National Fireproofing Co. plastered on the soffit with 1 in. special plastering. Of these two tests the test with the Gilmour doors is certainly of a most interesting character and well merits being dealt with in detail in these columns.

The doors opened up quite a new vista in doors construction, for these doors are light and of good appearance, which cannot be said of the majority of existing fire-resisting doors, be they iron doors or armoured doors. The doors under investigation further showed that with some slight improvements a very considerable fire-resistance should be obtainable. As it is, both the doors under test had only a thickness of 1½ in., and one of the



View at 3.40 p.m. (from outside).



View directly after the Test (from outside).
THE GILMOUR DOOR TEST.



AN ILLUSTRATION OF THE CLIMATIC DIFFICULTIES IN FIRE-BRIGADE WORK AT A LARGE COLONIAL WAREHOUSE FIRE.

doors was a panelled door with panels only $\frac{1}{2}$ in. thick. Both the doors were of the composite description, *i.e.*, made of hardwood, soft wood and asbestos, in accordance with a patented method of the Gilmour Co. The doors were made in Canada and imported.

The following was the object of the test:—To record the effect of a fire of 60 minutes' duration at a temperature gradually increasing to 1,500 degs. Fahr. (815° C.), followed by the application of water for 2 minutes on the fire side, with the view of being classified as affording temporary protection (class B).

The door openings were to be approximately 2 ft. 6 ins. by 6 ft. 10 ins. (0'7619 m. by 2'0827 m.).

The following is the summary of the test:—

Solid Door.

The inner portions of the door and the woodwork forming the centre were carbonized and destroyed; the outer veneer curled on the face and cracked at the joints. The fire did not pass through the door.

Classification as affording "temporary protection" (class B) was obtained.

Panelled Door.

After 51 minutes flame came through under bottom of door.

After 54 minutes the outer face of the door burst into flame all over.

Almost the whole door was destroyed and fell on the application of water at the end of the test.

Classification was not obtained

This object and summary we would supplement by two illustrations, showing the doors after 48 minutes and after 55 minutes, *i.e.*, just before the close of the test.

As to the construction of the doors, the following is their specification:—

The north (left-hand) "solid" door was made quite flush or flat on both sides, the core strips being fixed vertically in the style portions and horizontally in the centre. Surrounding the core on both faces and on the edges was a sheet of asbestos board, $\frac{1}{2}$ in. thick (0'031 m.), fixed with fine French nails 1 in. long (0'254 m.); on this was glued and pressed by hydraulic pressure a veneer of oak $\frac{3}{8}$ in. thick (0'047 m.). The total thickness of the door was 2 ins. (0'0508 m.).

The south (right-hand) door was con-

structed with five horizontal panels, the finished thickness of the panels being $\frac{1}{2}$ in. (0'127 m.), the frame constructed as above and the panels of five thicknesses; the centre core was pine, on either side of which was a sheet of asbestos, as above described, and on the outside a veneer of oak was glued all as described for the "solid" door. The total thickness of the door was 1 $\frac{1}{2}$ ins. (0'444 m.). The frames were in each case 4 ins. by 3 ins. (10'16 m. by 0'762 m.), of oak with $\frac{1}{2}$ in. rebate (0'127 m.), secured to the brick reveals with deal plugs and screws. The sill was 2 ins. thick (0'0508 m.).

The size of each door was 2 ft. 6 ins. wide (0'7619 m.) by 6 ft. 10 ins. high (2'0827 m.).

The frames were pointed all round with lime-mortar where fixed into the brick reveals.

Each of the doors were hung on two 4 $\frac{1}{2}$ in. (11'43 m.) iron butt hinges, and each secured with three 4 in. (10'16 m.) iron neck bolts fixed on the outside. The "solid" door was fixed in the north opening and the panelled door in the south opening. Both opened inwards towards the fire and were fixed in position on June 17th, 1905.

IMPENDING REPORTS.

We understand that the next two reports to be issued will deal with wire-glass (namely, a test undertaken in March last with three vertical openings filled with wire-glass and continued in June with four horizontal openings, *i.e.*, skylights filled with wire-glass, the wire-glass being provided by Messrs. Pilkington Brothers) and polished glass (namely, clear glass having been used in some of the openings). These reports are expected in September.

IMPENDING TESTS.

The autumn arrangements have not yet been completed, but among the tests already arranged for is a test with a concrete floor of various aggregates, already referred to, and a ferro-concrete floor on the Coignet system. There will also be a floor under test constructed by the New Expanded Metal Co., which floor is to be erected in the Committee's new extra large testing chamber, of which the interior measurements are 20 ft. by 22 ft. 3 ins. The first two floors, it is anticipated, will be tested towards the end of September and the last-named one in October.

It is also anticipated that there will be a test in September with Mr. Jabez Thompson's protective coverings for stanchions, and a form of ceiling construction intended to protect existing floors by Messrs. Cullum & Co.

Of floors of a proprietary character great interest will no doubt be centered in the ferro-concrete floor, but there is no doubt that the test of primary importance during the autumn session to the building world generally will be the one with various concrete aggregates in which the Associated Portland Cement Manufacturing Co. are assisting.

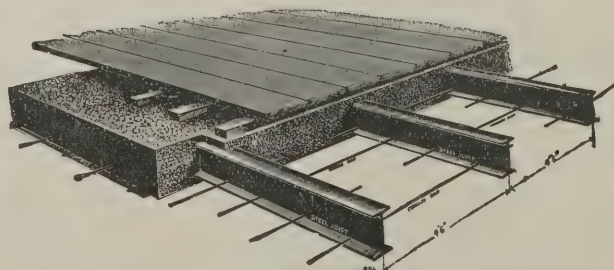
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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

September 6, 1905. Vol. 22, No. 552.

6, Great New Street, Fetter Lane, E.C.

Summary.

A correspondent says after a long experience he has found that where mischievous expansion has occurred in concrete floors, in every case the aggregate had been furnace ashes, which he characterizes as a cheap but dangerous and untrustworthy material. Clean river ballast or broken stone are much safer. (Page 141.)

In Japan the master-carpenter combines in himself the functions of architect, contractor and builder. He may be ranked with the artist almost as much as with the artisan. Once you have made a contract with him you have entered upon an agreement which lasts a lifetime, unless there is good reason for breaking it. (Page 141.)

A contemporary draws attention to the misrepresentations practised on firms by bogus "builders' merchants." (Page 136.)

A drinking trough for cattle, built of brick cement rendered, is described on p. 141 and illustrated by detail drawings.

Staining is considered the most practical way of finishing shingles in America. Creosote stains possess advantages over oil stains in that they penetrate more deeply into the wood, and being slow to dry, last longer. For this reason they protect the shingles better against dry-rot. (Page 144.)

In the planning of a crematorium provision should be made for a chapel or cremating hall, incineration chamber, vestry and a waiting-room. Every building should be so arranged that the head of the catafalque or entrance into the incinerating chamber faces due east. The cremating hall or chapel should be planned with a minimum floor space of 1,200 ft. super., this being exclusive of the space occupied by the catafalque or table upon which the body is placed during the service. (Page 132.)

Work on the tower of Canterbury Cathedral proceeds steadily. The whole of the south face has now been strengthened and solidified, and operations on the west side have been commenced. The condition of the stonework has proved to be more serious than was anticipated. (Page 143.)

A number of interesting papers are to be read before the Architectural Association during the forthcoming session. (Page 137.)

The timber trade at Liverpool has lately been rather dull owing to the stoppage of work due to the annual "wakes" and holidays, but there are one or two big jobs which keep up a fair demand. Pitch-pine stocks have been accumulating and are now largely in excess of what they were a year ago. (Page 140.)

The fineness should control the apportionment of cement by weight; if this is done the special quality of the cement will have to be considered, for it will not be necessary to use so much in weight of the best quality cement as of that of an inferior quality. (Page 142.)

Decoration of Government Buildings.

THE way in which the encouragement of art has been neglected by successive Governments in this country is nothing less than scandalous. With all the resources and wealth of modern civilization, we in this greatest empire the world has seen will rank as greatly inferior to small cities and principalities such as Venice and Athens in the encouragement which they gave to all that is highest and noblest in ideals. Our monuments are stunted, unoriginal, unimaginative and ugly. Some few private persons and municipal authorities have done the best in their power to provide opportunities for the education of talent to be worthy of our age, our race and our civilization, but Parliament as representative of the nation has done practically nothing. Our public buildings are not designed solely to serve commercial purposes—to provide accommodation at the least cost—and therefore they are incomplete in expression without the decorative arts, which are part and parcel of architectural art in its highest idealistic phase. Without opportunity for culture, how can our artists be trained to make the best of any work that does come their way—art must lag behind the rest of our civilization. The Law Courts, South Kensington and the British Museums belong to the long list of the incomplete. One would have expected our legislators to have made efforts to render their own home and the representative building of the nation—the Houses of Parliament—beautiful with the decorative arts, but the record shows that they are ignorant of the finest feelings of mankind. Can we wonder at the jobbery, the scandals, the want of high ideals betrayed in Parliamentary life when legislators live amid surroundings uninspiring, to say the least? An agitation has been carried on respecting the decoration of the Palace of Westminster for the past half century, and there now seems some prospect of a further enquiry. Lord Stanmore recently moved in the House of Lords that a Select Committee should be appointed to enquire into and report upon the unfinished condition of the decorations, and he received from Lord Windsor the answer that the Government were willing to agree to an enquiry, but that the exact form it should take would have to be considered. The question of suitable mediums for decoration is somewhat difficult, but since the decision in favour of fresco was come to, much knowledge has been gained. Experiments have been made to investigate the action of atmospheric conditions upon various kinds of decoration, and there is now plenty of variety and more prospect of success. Such an enquiry at the present moment would be very opportune, for the question of decorating the new public

buildings in progress in Whitehall and at South Kensington must shortly come up for decision.

Architects' Fees.

THE question of fees is one that continually agitates the architectural profession. The R.I.B.A. and international congresses have from time to time taken the question in hand, but the present custom is decidedly chaotic. A fixed scale, of course, causes restrictions and produces anomalies, but the necessity for some recognized scale of payment is obvious. For instance, it stands to reason that an architect who does his work conscientiously and is very painstaking should not receive the same payment as his more incompetent and slipshod brethren. Of course he builds up a reputation which may gain an increased *clientèle*, but that is beside the mark. An architect has to do a good deal of plain constructive work, but he is also concerned with the artistic expression of the nature and function of a building; and whereas a fixed scale of payment may not work badly in the former aspect, it cannot but work deleteriously in respect to the latter. Moreover, some buildings are plain and straightforward, but cost a good deal, whereas others which are much smaller entail more work and ability. Therefore it is unfair that these latter should receive less payment than the others. Some of the large works, indeed, are a mere repetition of parts. Then, again, commission is based upon the actual cost of the building, and this encourages a disregard of economy and of extras. If the percentage system must remain it would be better for payment to be made upon the limits of cost imposed by the client, whether the actual cost works out at less or more than this sum; and where extras are entailed by circumstances outside the province of the architect, then extra payment should be made for this by special arrangement with the client. A sliding scale would be advisable so that buildings within certain limits of cost should be paid for at fair rates of percentage, while if a table of equitable rates of payment for various classes of buildings were drawn up it might in great part solve the difficulty. The present method of paying the commission in portions such as 2½ per cent. for the plans, elevations, sections and specification, an extra ½ per cent. for procuring tenders and 2 per cent. for supervision, while it partly meets the necessities of the case where an honest client cannot complete an undertaking, works very hard when an unscrupulous client after securing the drawings hands them over to someone else to supervise, or does without supervision at all. The present Institute schedule stands in urgent need of revolutionary revision.



CREMATORIUM, MILAN, ITALY.

PLANNING OF CREMATORIA AND COLUMBARIA.

By Albert C. Freeman.

"Why hide reason's or affection's eyes?
The grave pollutes—the furnace purifies."

A MOST important subject demanding the attention of public bodies is the existing method of disposing of the dead. The subject, which is perhaps not one of the most pleasant, is at the same time one which must be faced before long. Its discussion, both from the point of reverence and its effect upon the living, is by no means new. The number of ways the ingenuity of man has devised for the disposal of the dead is far, greater than would be imagined.

"Many have taken voluminous pains to determine the state of the soul upon disunion, but men have been most fastidious in the 'singular contrivances' of their corporal dissolution."*

I do not propose to discuss the "singular contrivances," but to simply confine my attention to the two methods adopted by civilized nations—inhumation and cremation.

With our existing method we place the body beneath the surface of the ground, so that the earth may absorb and neutralize the products of a slow decomposition. Some of our cemeteries are established on a clayey soil, the bodies interred being locked up in clay vaults which allow little egress to the dissolving elements; they become cesspools of human remains, with their noxious vapours partly sealed, only to be fully released when a fresh interment takes place, which many a mourner has experienced to their cost. Interments in sandy soil are, on the other hand, even more dangerous: they assist the gases generated by decomposition, together with putrescent matter, to escape into the air above and water beneath.

The late Sir Henry Thompson said:

* Sir Thomas Browne, "Hydriotaphia."

"When the globe was thinly peopled, and when there were no large bodies of men living in close neighbourhood, the subject was an inconsiderable one and could afford to wait, and might indeed be left for its solution to sentiment of any kind; but the rapid increase of population forces it into notice, and especially man's tendency to live in crowded cities. There is no necessity to prove, as the fact is too patent, that our present mode of treating the dead, namely, that by burial beneath the soil, is full of danger to the living."

In almost all the nations of Europe the distance from a graveyard at which wells may be sunk is regulated by legislative enactment. The distance varies in different parts: in Italy, the prohibited distance is about 300ft.; in France and Austria it is almost double this distance. At a hygienic council convened in Brussels in 1852 it was held that 1,200ft. was the minimum distance that could be regulated as protective. I ask, then, if there be no risk of foul liquids entering and polluting wells or springs near burial-grounds, why should these precautions be adopted?

With the ever-increasing growth of our cities, can we afford to expend large sums of money on cemeteries and sacrifice the rights of the living to the accommodation of the dead?

We have no assurance that the bodies of those we have buried will remain there for ever. It may surprise some to hear that the Law Courts, the Bank of England, King's College Hospital, and many other buildings of note in London, are standing upon old graveyards. Before another generation has passed away the burial-grounds situated in our principal cities will meet the same fate: that which remains of the bodies carefully and tearfully laid away (with money lavishly spent on well-constructed brick vaults and pompous funerals) will be removed by the pick or some other more up-to-date instru-

ment, by a class who will have recognized the sickening state of corruption the body undergoes when buried beneath the soil.

It has been argued that there is no finer disinfectant for disease than earth; this fatal illusion that the earth renders harmless that which is given off from the body must be dispelled; proof of the fact is superabundant. Of course evils arising from earth-burial will vary in intensity according to the character of the soil in which the interment takes place, but under the most favourable circumstances dangerous emanations must arise from burial-grounds, there being no more natural escape for the gases of decomposition than by levitation.

Mr. William Robinson, F.L.S., in his work "Cremation and Urn-burial, or Cemeteries of the Future," says: "During the time that the merits of cremation have been under discussion its advocates might have strengthened their case had they been cognizant of the way in which two of the cemeteries in South London were being managed."

The matter he refers to is as follows: "An impression prevailed among those residents near Battersea cemetery that an exceptional amount of sickness in the neighbourhood, including cases of scarlet fever and diarrhoea, was due to the overcrowding and consequent insanitary condition of the burial-ground. Whatever the cause of the sickness, its existence was a fact."

"The medical officer of health for West Battersea, Dr. Oakman, reported to the Wandsworth Board that the overcrowding also was a fact, and that it was assuming dangerous and alarming proportions. The Home Office was communicated with, Mr. Holland held an enquiry, and all that had been alleged was proved or admitted. The only person responsible in such a case for the violation of the law is the superintendent of the cemetery, who may be fined for every proved offence. In this instance his resignation was required by the Home Office."

Sir Charles Cameron says: "I might multiply examples *ad nauseam* to prove the danger of contamination to our water-supply which many of our burial-grounds present. It is sufficiently evident, however, that every burial-ground must be drained, and that the drainage must ultimately find its way into our rivers and watercourses from which water is taken for domestic purposes, thus affording an obvious channel for the propagation of the infection."

We demand the quick removal of offal, perfection in ventilation of our homes and public buildings, the construction of drainage and plumbing work on scientific principles for the purpose of guarding health; still, we continue to dispose of our dead in a way that violates more than any other the health of the communities. Some of our greatest scientists have declared over and over again that our present method of burial is against the general laws of sanitation and decency; how much more is it, then, in the case of those who die from infectious disease? Pressure should be brought to bear upon the Government to bring in legislation making it compulsory that the bodies of all persons dying from infectious diseases shall be destroyed by burning, and prohibit the burial of such bodies. We should then somewhat check the spread of disease and safeguard the living against continuous epidemics of infectious disease.

As, I venture to think, I have proved our present system of burial is accompanied by dangers, we will give a glance at the question of cremation as a method of disposing of the dead.

Cremation was practised by the primitive Aryans, who consigned the bodies of the dead to the flames in the belief that by that means alone the body could be transformed into a spirit. In Rome, from the close of the Republic to the end of the fourth Christian century, burning was the general rule.

At one time all the great nations of the world, the Egyptians, Persians and Chinese excepted, practised cremation. The Egyptians staunchly adhered to their custom of embalming or disembowelling their dead, thus rendering them somewhat harmless. In China cremation is, comparatively speaking, a modern practice. There is evidence to show to what extent cremation was practised in this country by the Druids, Celts and the early British; many examples of the urns used by them to preserve the ashes of the dead may be seen in the British Museum.

In 1797 a Jesuit Father, and a member of the Institute of France, proclaimed the necessity of substituting cremation for burial; there was some discussion of the ways and means, and an attempt was made to secure an enactment, but it was futile, and in the end the subject became dormant. In 1866 various papers were published in Italy commending the method of cremation, but it was not until 1872 that any practical experiments were made; in this year Gorini published the results of his experiments. In 1873 Professor Brunetti detailed his experience, and exhibited the results with a model of his furnace at the great exhibition at Vienna. In France the adoption of cremation was delayed by the fear of the process affording criminals an opportunity of destroying any trace of their crimes. In 1875 a report was drawn up in favour of cremation by a Commission of Municipal Councillors and Sanitarians, but the police objections nullified it. The agitation, however, continued until 1885, when the Minister of the Interior gave his permission for the establishment of a crematorium, but to be used merely as an experiment and for cremating the *débris* of the dissecting-room. In 1887 the law was so amended that any person in a position to dispose of his worldly belongings by will was given complete



CREMATORIUM AT HEIDELBERG GERMANY. PH. THOMAS, ARCHITECT.

option in respect to the burial or burning of his body after death. In 1889 there were forty-nine cremations at the Paris Municipal Crematorium; in 1903 the number had reached 306.

The history of cremation in this country dates back to 1874, when the late Sir Henry Thompson contributed an article to the "Contemporary Review" describing the process and arguing strongly in favour of its adoption. A society was formed for the purpose of advocating cremation in April, 1874.

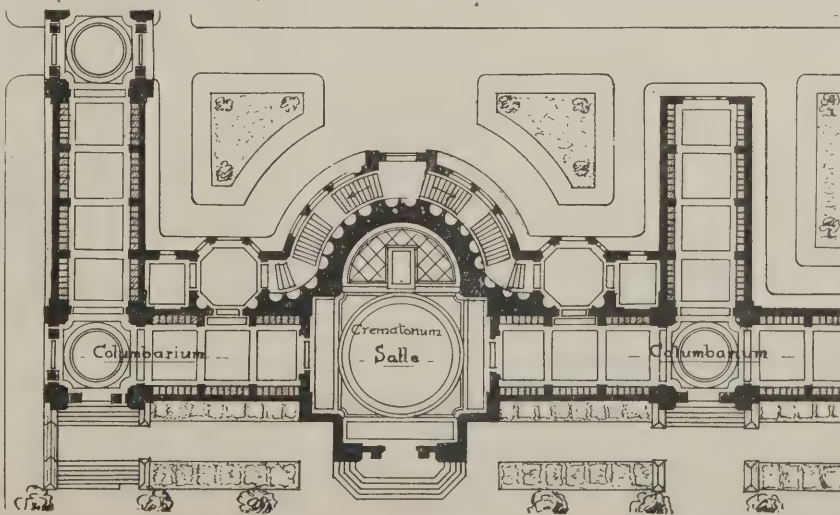
In 1879 the crematorium at Woking was erected, but as the Home Office prevented its utilization it lay idle for several years. In 1882 the council of the Society was requested by Captain Hanham, of Blandford, Dorsetshire, to undertake the cremation of two deceased members of his family who had left express instructions to that effect. The Society being unable to undertake the cremation, Captain Hanham then erected a crematorium upon his own estate, in which the

wishes of his relatives were successfully carried out. He died a year later, his body being cremated in the same furnace.

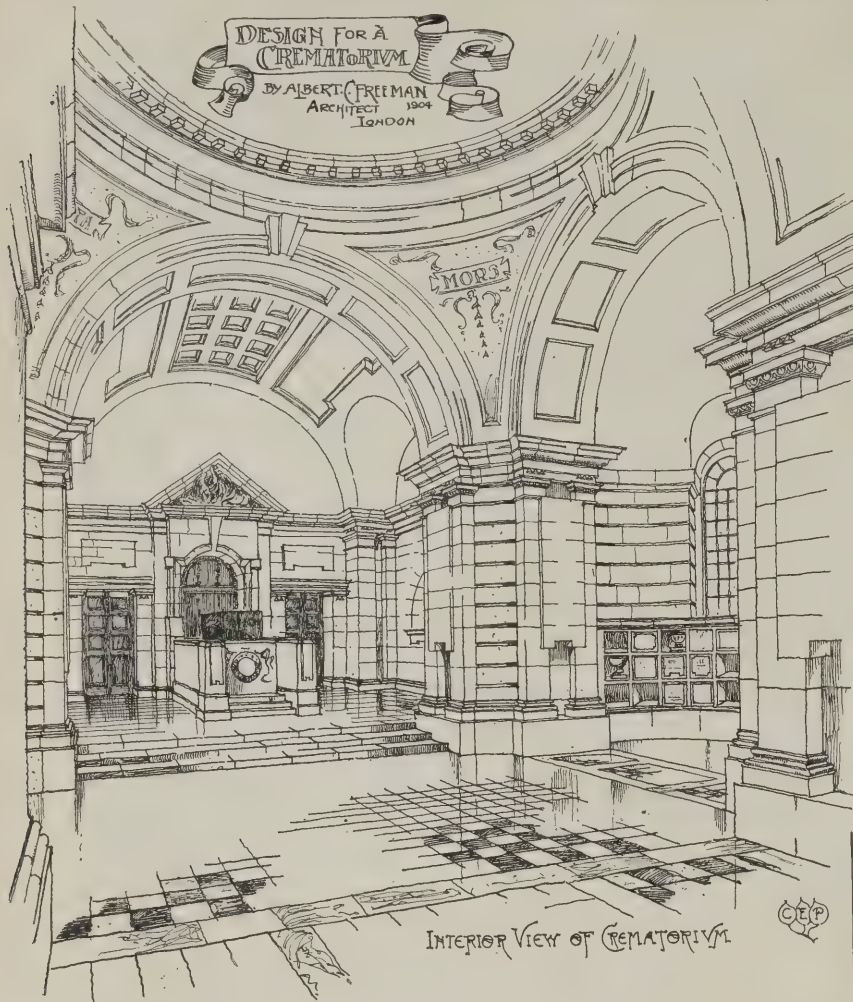
The Government entered no protest against this operation. In 1883, a cremation having taken place in Wales in defiance of the coroner's authority, legal proceedings were consequently instituted. These resulted in 1884 in the decision of Mr. Justice Stephens declaring that cremation was a legal procedure provided it be effected without nuisance to others.

In April, 1884, the House of Commons refused to pass a Bill providing for the regulation of cremation. The Cremation Society of England, however, backed up by the decision of Mr. Justice Stephen, announced that the crematorium at Woking was at the service of the public providing certain conditions were complied with.

On March 20th, 1885, the Woking Crematorium was used for the first time; during that year three bodies were cremated. Since then crematoria have been erected at Golders



GROUND PLAN OF CREMATORIUM AND COLUMBARIUM AT GENEVA. J. BROCHER, ARCHITECT.



Green, N.W., Liverpool, Manchester, Sheffield, Birmingham, Hull, Leicester, Bradford, Ilford (for the City of London), Darlington, Headingley and Glasgow. The total number of cremations in this country to the end of 1904 was 4,407. Crematoria are contemplated at Newport (Mon.), Harrogate and Hornsey.

Cremation was introduced into Germany at Gotha in 1878, since which time several crematoria have been erected. The first cremation took place in 1878; up to the end of 1903, 7,551 incinerations have been performed.

The first cremation took place in Switzerland in 1889, and up to the present over 1,400 bodies have been cremated. In Denmark the first was in 1893, and up to the present the total is 275. In Sweden the first was in 1887, and up to the end of 1903 the total is 915.

Cremation in the United States dates back to 1873, when it was proposed that a crematorium should be erected in New York, but the idea was not carried out. The first building was erected in 1876 by Dr. F. Julius Le Moyne, of Washington; it was primarily designed for the cremation of his own body, but, to create interest in the subject and to assist the education of the question, he permitted its occasional use; it was utilized for the first time in December, 1876, when the body of Baron de Palm was cremated. For eight years this crematorium was the only one on the American Continent. In 1884 the second was erected at Lancaster, when three bodies were cremated during the first year; the year following the New York and Buffalo crematoria were erected, when nine bodies were cremated in the first mentioned and one in the second. Since that time year after year has seen more crematoria erected, until now there are twenty-five at the service of the public. In 1902 the total number of bodies cremated in the United

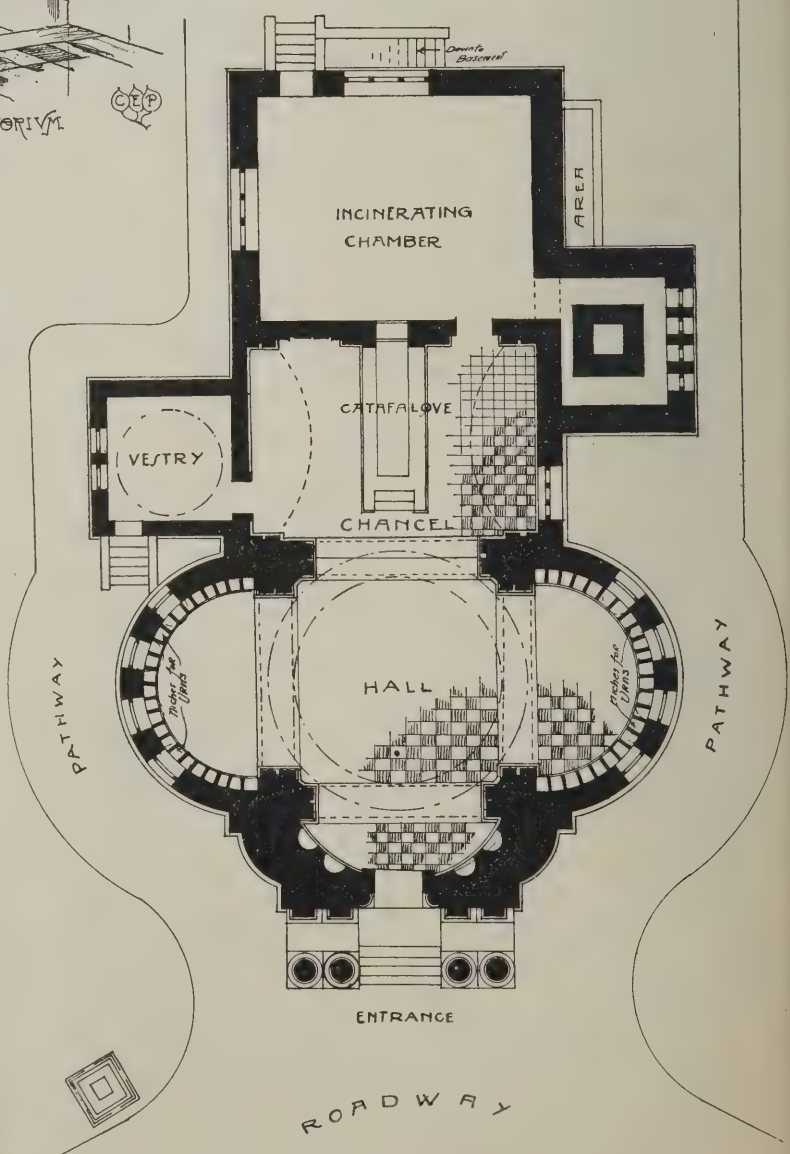
States of America was 3,105, and from the commencement up to the end of 1902, 19,071. (The complete statistics of 1903 and 1904 I am at present unable to obtain.)

The first crematorium to be erected in Canada was at Montreal in 1902; and in Australia, at Adelaide in 1903.

The indifference on the subject of cremation we must conclude is in a large measure due to ignorance. We may now enquire as to the process of cremation and what constitutes a crematorium and columbarium. The body is placed during the service upon a catafalque or table; when the committal sentence is reached the shell is either withdrawn through an opening at the rear or lowered by noiseless mechanical means to the cremating-room, where it is deposited on a carriage which conveys it to the incinerating chamber of the furnace. No flames touch it: it is placed in a chamber which presents a bright orange-coloured tint, and is destroyed purely by the agency of gases generated either by the use of coal, coke or gas. In the course of an hour and a half the remains, which are in the form of ashes, are swept by an asbestos brush into the urn which is placed below the heated chamber. The remains are afterwards sealed and handed to the representatives of the mourners, to be subsequently deposited in the niche of a chapel, colonnade or columbarium, or may be buried in the earth.

Planning and General Arrangement.

Among the subjects upon which the profession does not possess any great amount



DESIGN FOR CREMATORIUM BY ALBERT C. FREEMAN.

of knowledge, and which is before long bound to become not only an interesting but a profitable addition to architectural practice, is the design of crematoria and columbaria. Speaking generally, the following provision should be made in the planning of a crematorium: a chapel or cremating hall, incinerating chamber, vestry and a waiting-room for the use of those relatives or friends anxious to remain until the body has been reduced to ashes.

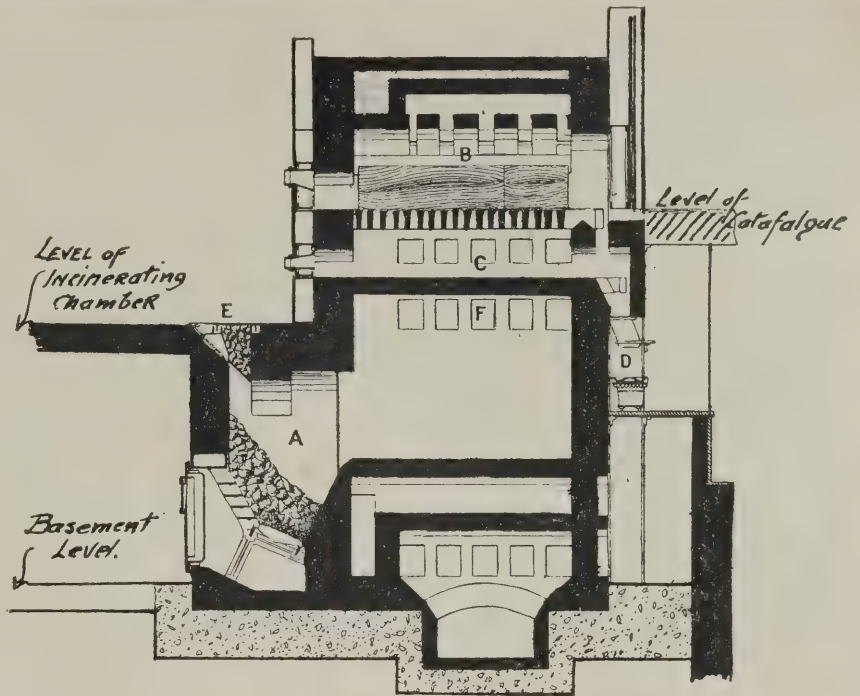
As these buildings are invariably unconsecrated, it is immaterial whether or not they are placed upon the site with a due easterly aspect; at the same time I should certainly advocate that every building be planned so that the head of the catafalque or entrance into the incinerating chamber be arranged to face due east. The cremating hall or chapel should be planned with a minimum floor-space of 1,200ft. super., this being exclusive of that space occupied by the catafalque or table upon which the body is placed during the service.

I have found in most of the foreign crematoria that niches are provided in the walls of the chapel for the reception of urns, thus making a combination of a crematorium and columbarium.

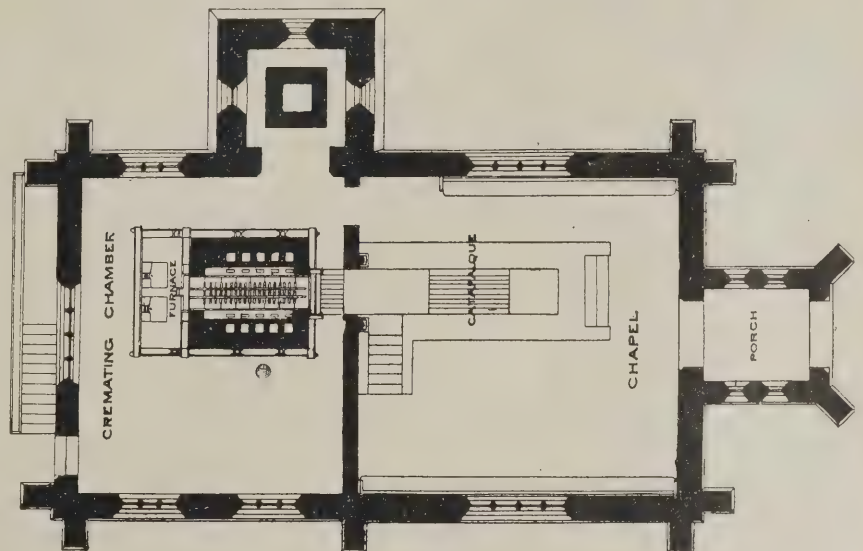
The plan on the previous page shows a crematorium, with hall, incinerating chamber and vestry; in this case the incinerating chamber is arranged on the same level as the chapel or hall. Some designers consider it a more advisable plan to arrange the whole of the cremating apparatus in the basement under the chapel, or at a lower level than the latter, so that when the committal sentence in the funeral service—"ashes to ashes"—is reached the coffin is automatically lowered as in earth-burial, instead of being drawn through the opening at the end of the catafalque. It is, however, necessary in all cases to provide a basement to receive the lower portion of the incinerating furnace, the stoking of the apparatus being performed at this lower level (see section on this page), which should have a height of about 7ft. The majority of the foreign crematoria have their cremating chambers under the chapels, or at a lower level than the same. In Great Britain, with the exception of Glasgow, they are placed on the same level as the chapels.

The incinerating chamber, when planned for a single furnace, should be 35ft. 6ins. long and 21ft. in width; when two or more furnaces are provided, then the superficial area will be increased in proportion. The chimney shaft should be arranged in as close proximity to the cremating furnace as possible; it should be erected to a minimum height of 60ft. Some of the crematoria chimneys are carried up to a greater height; for instance, the Hull Municipal Crematorium chimney is 70ft., but, to suit the working of both Messrs. Simon's and Toisoul, Fradet & Co.'s furnaces, 60ft. will be found satisfactory. It is advisable to clothe the chimney with a tower and avoid the sight of a feature which is anything but artistic, however well treated.

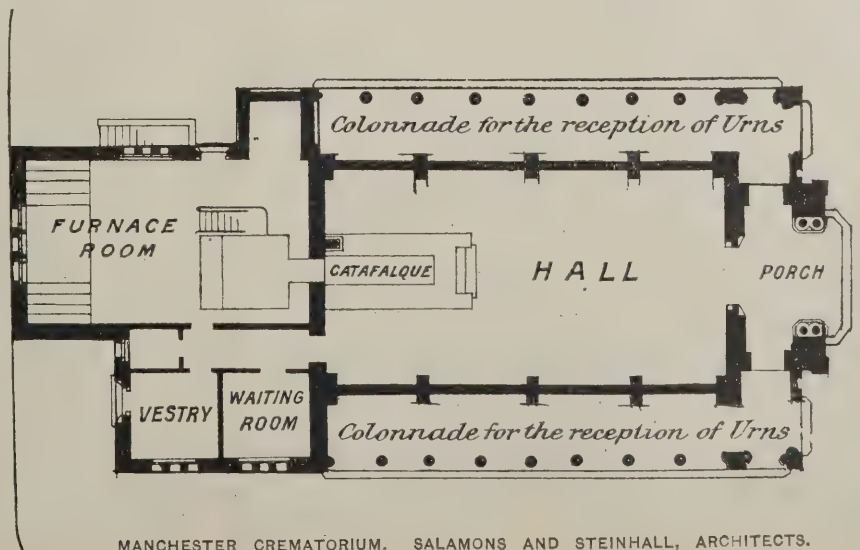
In the planning of columbaria it is the general practice to arrange a large hall with the external walls honeycombed with niches or, latebræ. The vase-shaped urns measure about 1ft. 6ins. high, and those of the box-shape measure 16ins. by 8ins. and are 8ins. high. The only columbaria in this country are at Golders Green and Liverpool, but neither can be taken as good examples. There is a columbarium in the Hedon Road Cemetery, Hull, which is constructed in the form of a grotto; it is both picturesque and original. The Liverpool columbarium is arranged in the crypt under the chapel, and has provision for upwards of 480 urns. In the Manchester crematorium provision is made for the reception of urns both on the inside and outside of the external walls of



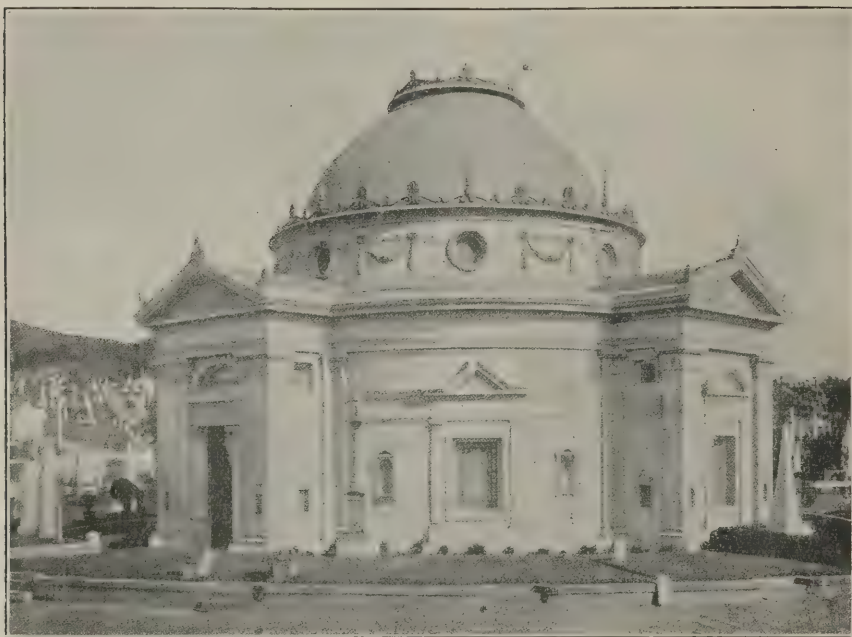
FURNACE IN OPERATION AT THE BIRMINGHAM CREMATORIUM.



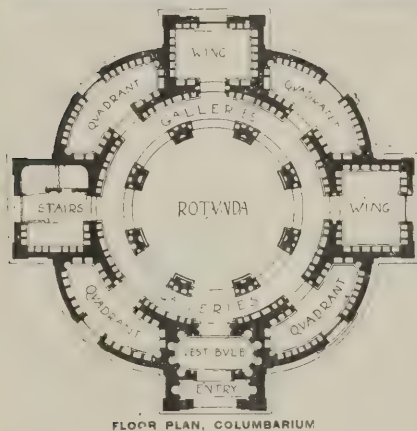
HULL CREMATORIUM. A. E. WHITE, A.M.I.C.E., CITY ENGINEER, HULL.



MANCHESTER CREMATORIUM. SALAMONS AND STEINHALL, ARCHITECTS.



COLUMBARIUM, ODD FELLOWS CEMETERY, SAN FRANCISCO, U.S.A. B. J. S. CAHILL, ARCHITECT.



Builders' Notes.

Bogus Builders' Merchants.—We take the following from the "Ironmonger": "A fire-grate maker received from a provincial town an enquiry from an unknown person requesting him to send his list and quote best trade terms. The letter was on plain writing paper, but accompanying it was a printed card giving the writer's name and address, and the legend 'Builders' Merchant.' The maker, doubtful rather of his correspondent's good faith, wrote asking for a trade reference and an assurance that his class of wares was stocked by him. The reply to this was a bankers' reference and an explanation that the goods were wanted for buildings in course of erection. The writer did not even

state that he was a builder, and for all we know he may be only a speculator in cheap property. The term 'builders' merchant' has been grossly abused and misapplied, but possibly six out of ten firms to whom the card was addressed quoted trade terms without making enquiry, to the hurt of traders legitimately entitled to the use of the words."

Owing to the collapse of a Building at Bolton recently Mr. Rupert Brockbank, an estate agent, was crushed to death. Two others were seriously injured.

Reform of the By-laws.—The Staines Urban District Council have appointed a committee to consider and report to the Council what alterations in the existing by-laws may be necessary, or desirable, so as to afford facilities for the erection of dwellings for the working classes at a less expense than is possible under the by-laws at present in force.

Scientific Plumbing.—A part of the course of advanced instruction for plumbers given by the Plumbers' Company at King's College, London,

includes visits to notable buildings where plumbing and sanitary work is in progress. A party of students attending this course recently visited the workmen's dwellings at Grove End Road, St. John's Wood, where the foreman in charge explained the character of the work and pointed out the various specialities. The details of the drainage were described to the students, and a section of the drains tested by hydraulic pressure to prove their soundness. The whole of this contract has been executed by Messrs. Davis & Bennett, of Westminster, and registered plumbers were employed throughout the work.

An Exhibition of Advertising Drawings and Designs is being held by Messrs. W. H. Smith & Son by way of inauguration of their new offices at 12, Norfolk Street. The drawings shown are by Cecil Alden, Lewis Baumer, R. P. Gossop, John Hassall, R. Pannett, Charles Pears, H. Rowntree, S. E. Scott, Will Topham, Fred Taylor, and a large number of the leading draughtsmen and designers of the day.

A new Liberal Club at Honley is being built of stone with ashlar dressings, and is estimated to cost £1,700. The work is being carried out by the following firms:—Masons, Messrs. R. Jenkinson & Son; joiners, Messrs. Ben Oldfield & Co.; plumber, Mr. Harry Webster; plasterer, Mr. Shaw Whitehead; painter, Mr. F. B. Hinchliffe—all of Honley; and concreter, Mr. John Cooke, Huddersfield. The plans have been prepared by Mr. J. Berry, architect, Huddersfield.

A new Scheme of constructing Polling Booths has been devised by Mr. James Thomson, city architect, Dundee. Hitherto temporary polling booths have been erected under contract, and removed on the day following the election: these cost £45 last year: but by Mr. Thomson's system, after an initial outlay of £100, the annual expense will be not more than £3. The compartments are designed in sections, and can be erected in ranges of any number to suit the requirements of the various polling booths. The Works Committee have approved of the scheme and recommend the Town Council to adopt it.



MAIN ROTUNDA, COLUMBARIUM, ODD FELLOWS CEMETERY, SHOWING ENTRANCE TO STAIRWAY AND MAIN COLUMNS SUPPORTING DOME.

the chapel, those on the outside being protected from the weather by colonnades.

The most magnificent building in existence is that of the Odd Fellows Cemetery Co. at San Francisco.

This building is planned with a large rotunda having four quadrants leading from the same; it is arranged in two storeys, and has provision for upwards of 5,000 niches of great variety both in size and style.

It is essential in planning a columbarium to arrange all niches so that they are easy of access. The front of each is enclosed with marble or bevelled plate-glass, held in position by means of detachable copper or bronze frames, the interior being tinted, frescoed or draped.

New Poor Law Offices at Camberwell, in Peckham Road, are being completed. Mr. Edwin T. Hall, F.R.I.B.A., is the architect.

A Presbyterian Church Hall at Glanton has been opened. The building, which was designed by Mr. Adam Hunter, of Glanton, cost £500.

A new Pavilion at Dunoon has been erected. The building is designed in the free Classic Renaissance, the front building consisting of a row of shops with reception-rooms above, the back building being the hall, octagonal in shape. It is constructed of stone and brick, with a steel roof covered with tiles. There are four staircases leading to the gallery. Accommodation is provided for between 3,000 and 4,000 persons. At the outset the estimated cost was £6,000, but it is expected to reach £10,000. Mr. J. Fraser, of Dunoon, was the architect.

Views and Reviews.

A New Book on Design.

By this time there is no dearth of books on design and ornament, and we do not see that this present text-book would have any claim for appearance if it were not written on the lines of the revised syllabus of the Board of Education. The author's intention, however, is not so much to supply a few recipes which the student might get off by heart for the purpose of successfully passing the examination—supposing this were possible or desirable—but rather to assist him in forming an intelligent understanding of the general scope and scale of the decorative arts. Each chapter has a somewhat ordinary historical introduction, and for the rest consists of good advice on the elaboration of design and its application as ornament and decoration, especially in its treatment as an architectural adjunct. But we do not think that the letterpress of the book calls for much comment. It is the illustrations which are admirable. Mr. Rhead is a master-draughtsman in line, and the manner in which he has produced the numerous drawings of architectural features, types of birds, insects, &c., are models for every student to study. Therefore we think this book will be valued far more for these excellent drawings than for the letterpress which accompanies them, and as such we bring it to the notice of our readers.

"The Principles of Design," by G. Woolliscroft Rhead, R.E., Hon. A.R.C.A. Lond. London: B. T. Batsford, price 6s. nett.

Measurement of Areas.

The object of this pamphlet is to draw attention to the advantages of Amsler's Planimeter as a means of computing irregular land areas from maps and plans, and at the same time to provide a brief description of, and simple instructions for using, that very useful instrument, together with an explanation of its working principles. As printed instructions are usually sold with the instrument the necessity for this book is not very obvious. Still, to those requiring further details of the working of the instrument we can commend this treatise. The explanations are extremely simple, and the author at once does away with the somewhat prevalent idea that the planimeter is a complicated and delicate piece of mechanism requiring special knowledge and skill in use.

"Land Area Computation made Easy. Being a Simple Treatise on Amsler's Planimeter, with Instructions for its Use," by W. Codd. London: E. & F. N. Spon, Ltd., price 6d. nett.

Stephenson's "Repairs."

A fourth edition of this well-known book is before us. It has been revised and the prices increased to meet the present cost of labour and materials, and a chapter has been added on modern decoration and recent improvements in house drainage, electric-lighting, bells, &c. The book is thoroughly reliable, compactly written, and will be found most serviceable to all connected with house repairs.

"Repairs: How to Measure and Value them in Competition," by George Stephenson. London: B. T. Batsford, 94, High Holborn, W.C., price 3s. nett.

Fletcher's "Valuations and Compensations."

In this third edition several minor additions have been made, including some to the tables at the end, and the book has been brought generally up to date. The call for another edition is the best possible testimony to the worth of the book.

"Valuations and Compensations," by Prof. Banister Fletcher, revised and re-written by Banister F. Fletcher and H. Phillips Fletcher. London: B. T. Batsford, 94, High Holborn, W.C., price 6s. 6d.

TRADES' TRAINING SCHOOLS.

THE report, just published, of Mr. H. Phillips Fletcher, F.R.I.B.A., F.S.I., A.M.I.C.E., Director of the Trades' Training Schools, on the work of this training centre for the building trades, states that the carpenters' class numbers thirty students. The fact that four medals were gained in this shop, including the "Banister Fletcher Medal," which has been awarded to Mr. E. J. Beesley, shows that the shop is well maintaining its position in the schools. The joinery class numbers thirty-six students and seven in the handrailing. There are fourteen students on the books of the masonry class. There are nineteen students in the painter-stainers' class, and the work reflects great credit upon the Painter-Stainers' Company. The plasterers' class numbers only four; this is most unsatisfactory, and it is to be regretted that the improvement shown last year has not been maintained. The plumbing class shows an increase of four students' and now numbers thirty-five. The smiths, class numbers seventeen, which shows a considerable increase on previous years. The repoussé class, lately attached, is much appreciated. The stonecarvers' class numbers fourteen students. The tylers' and bricklayers' class has twenty students, which shows that it is still maintaining its position. The woodcarvers' class numbers nineteen students, a slight increase on last session.

The report of the judges on the work done shows what excellent progress is being made by the students at the institution. In the carpentry department, particularly, the work was of such a high character that the judges had some difficulty in classifying the exhibits. Illustrations of specimens of work by the students are printed with the report, and they give a good idea of the fine standard of craftsmanship to which a diligent student may attain.

THE ARCHITECTURAL ASSOCIATION SCHOOL.

Curricula for Forthcoming Session.

THE curricula of the Architectural Association for the session 1905-6 has just been issued. Full particulars are given of the day school, evening continuation school, evening studio and evening lectures and classes.

The following papers will be read before the ordinary meetings of the Association:—

- Oct. 6. Annual General Meeting, President's Address and Distribution of Prizes.
- " 20. "London City Churches," Andrew Oliver.
- Nov. 2. Conversazione.
- " 17. "Old Manor Houses," J. A. Gotch.
- Dec. 1. "Turkish Architecture," E. F. Reynolds.
- " 15. "Church Towers and Spires," W. H. Bidlake.
- Jan. 19. Subject to be announced.
- Feb. 9. "Differences between English and French Gothic Art," Rev. G. H. West, D.D., A.R.I.B.A.
- " 23. "Porches and Approaches," F. T. Baggallay.
- Mar. 9. "French Modern Architecture," A. Vye-Parminter.
- " 23. "The London Club House of Last Century," A. W. Scames, M.P.
- April 6. "Valuations, Compensations, Light and Air," E. Greenop.
- " 27. "Fenestration," Walter Cave.

The papers to be read before the Discussion Section are as follows:—

- Oct. 25. "Casements and Lead Lights," H. F. Waring and C. Wainwright.
- Nov. 8. "Inexpensive Cottages," Geoffrey Lucas, A.R.I.B.A.
- " 22. "Village Schools," H. Passmore, A.R.I.B.A.
- Dec. 6. "The Conversion of the Jerry-builder," W. A. Forsyth, A.R.I.B.A.
- Jan. 3. "The Houses of Parliament," P. J. Turner, A.R.I.B.A.
- " 17. "The Ideal Architect from the Client's Point of View," Edwin Gunn, A.R.I.B.A.
- " 31. "Internal Steps and Stairs and their Treatment," A. C. Dickie, A.R.I.B.A.
- Feb. 14. "Modern Hotels and Restaurants," S. H. Hamp, A.R.I.B.A.
- " 28. "Shop Fronts," E. C. M. Willmott.
- Mar. 14. "Libraries," S. Towse, A.R.I.B.A.
- " 28. "Fences and Gates," W. L. Trant Brown.
- April 11. "Ferro-concrete," S. Byland.

Obituary.

Mr. James Richardson, builder, of 48, Larkspur Terrace, Jesmond, died suddenly last week, aged 71 years.

The body of Mr. Charles Robert Burton, a well-known Warrington architect and surveyor, was found in the River Mersey recently. Mr. Burton was over 60 years of age.

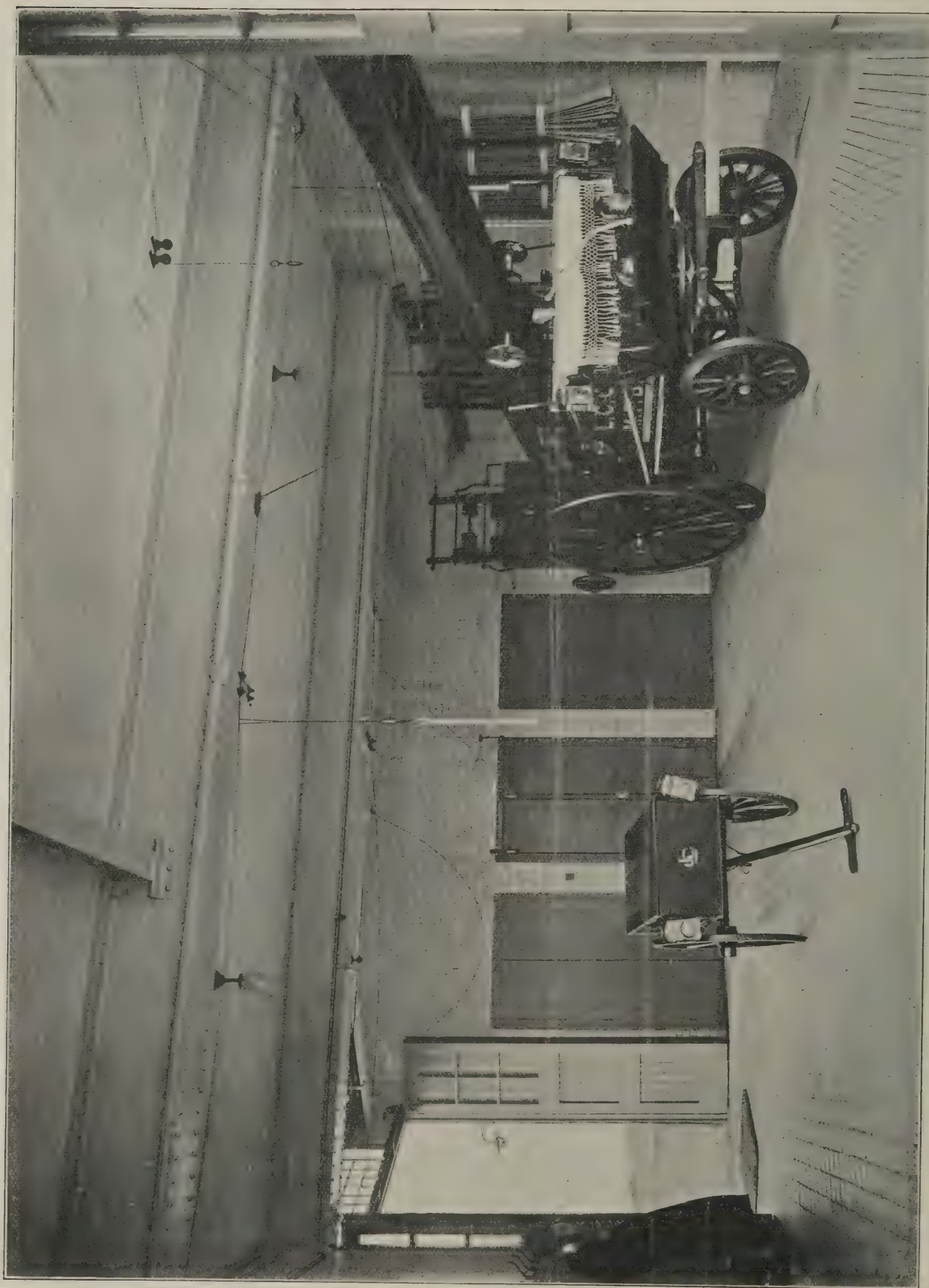
Mr. David Jenkins, contractor, of Swansea, died recently at the age of 72 years. He was for years a member of the firm of Thomas, Watkins & Jenkins, who carried out very important contracts in the neighbourhood. This firm dissolved partnership about ten years ago, and since then Mr. Jenkins had carried on business on his own account.

Mr. James Weir, F.R.I.B.A., of the firm of Weir, Burrows & Weir, architects and surveyors, died on Sunday week last at his residence at Clapham. A "Men who Build" article dealing with his work was published in THE BUILDERS' JOURNAL for February 4th, 1896. Mr. Weir carried on his business at 17, Victoria Street, Westminster, and acted as architect to the Westinghouse Brake Co., the Victoria Chambers Co. and numerous other companies. He was an authority on school buildings and a well known Methodist architect, having built a very large number of churches &c., notably the Wesleyan churches at Clapham High Street; Queen's Road, Battersea; Putney, Norbiton, Kingston, Fulham, Beckenham, Aylesbury; High Street, Manchester Square; Southgate, St. Leonards, Sevenoaks; Surrey Chapel, Blackfriars, and numerous others in various parts of the country, including the South Coast and Isle of Wight, one of his latest successes being the Victoria Hall at Deptford. He recently took into partnership his nephew, Mr. William May Weir, who had been associated with him for many years past; also his manager, Mr. Fred Burrows; who will continue to carry on the practice under the style of Messrs. Weir, Burrows & Weir as hitherto.

OUR PLATES.

THE London County Council fire-brigade station at Maida Vale occupies the site of Sefton Lodge and has a frontage to the main road of 67ft. 4½ins. The accommodation is for a sub-station (with provision for subsequently converting into a full station), and is contained on three storeys and basement. On the ground floor space is provided for a full-sized engine-room, stabling for two horses adjoining, and opening directly into the same. Swinging harness is provided over the horsed-escape. The ground floor also contains the watch-room, a recreation-room (for full-sized billiard table), various stores, and the station officer's quarters, comprising four rooms, scullery and w.c. In the basement are provided the laundry, drying closet and coke stores. The two upper floors contain accommodation for six married firemen, all in self-contained suites with separate sculleries and w.c.'s. Bathrooms are provided on each upper floor. The hose hoist is of open iron construction and is placed in the yard. The building has been carried out from the designs of Mr. W. E. Riley, F.R.I.B.A., the Council's superintending architect, and was erected by the Works Department in 1904. It is very carefully designed in every part.

In our issue for August 23rd we illustrated the interior of St. Mary's Church, Lancaster, the names of Messrs. Austin & Paley, of Lancaster, being stated as architects. This church is an old one, and Messrs. Austin & Paley have only been responsible for restoration work thereto from time to time.

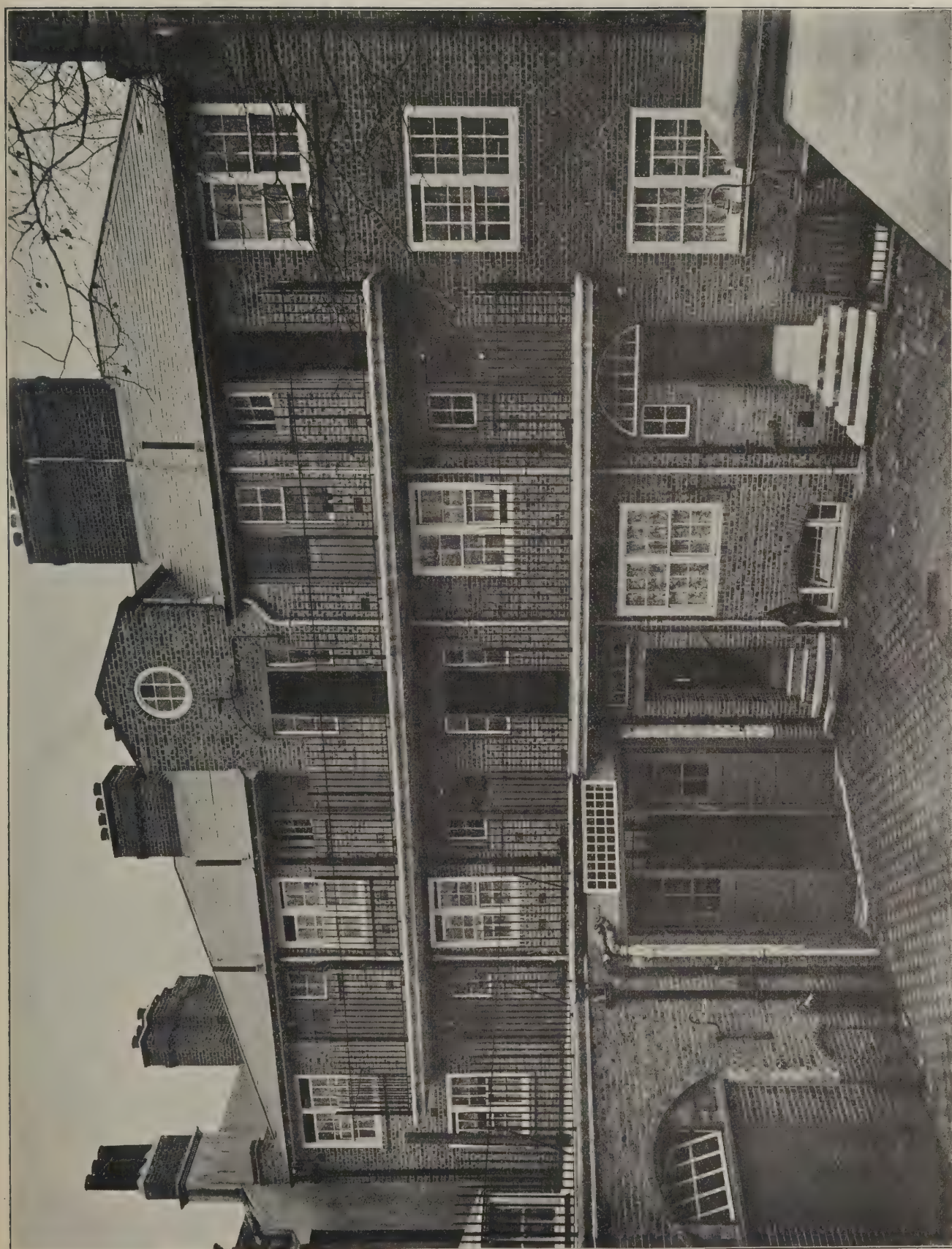


LONDON COUNTY COUNCIL FIRE-BRIGADE STATION, MAIDA VALE, LONDON, W.: THE ENGINE-ROOM. W. E. RILEY, F.R.I.B.A., SUPERINTENDING ARCHITECT.

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FRONT VIEW.



BACK VIEW.

LONDON COUNTY COUNCIL FIRE-BRIGADE STATION, MAIDA VALE, LONDON W. W. E. RILEY. F.R.I.B.A., SUPERINTENDING ARCHITECT.

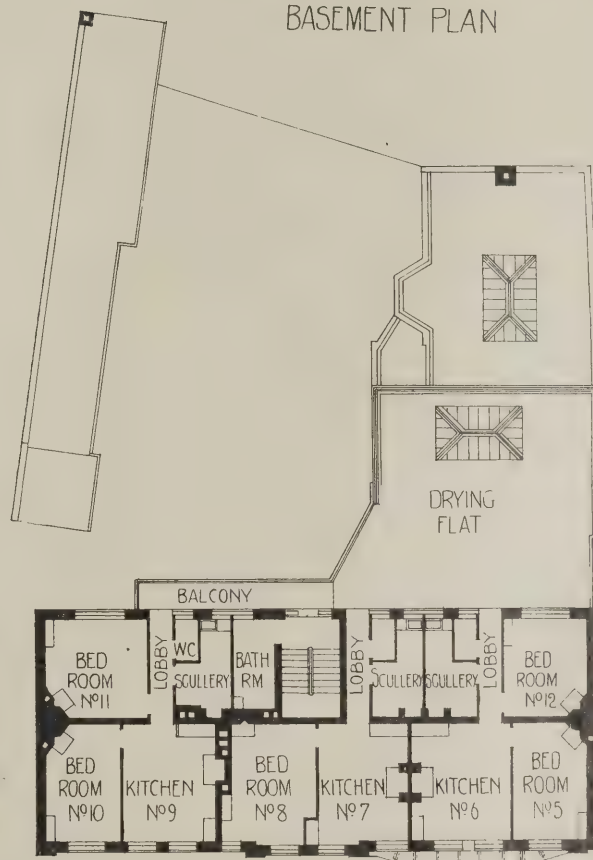
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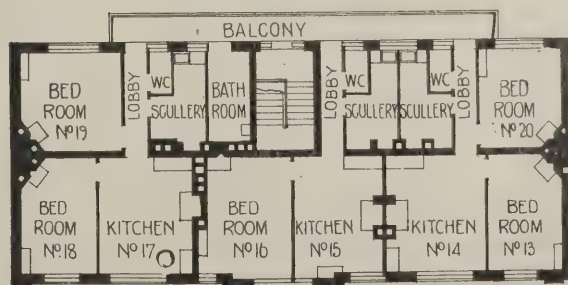
GROUND FLOOR PLAN



BASEMENT PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

THE TIMBER TRADE.

Liverpool Market in August.

(By Our Special Correspondent.)

BUSINESS in builders' timber at Liverpool has lately been affected by the stoppage of work in Lancashire and Cheshire by reason of the annual "wakes" and holidays. In the more important towns the "wakes" or summer holiday week is rigorously observed, mills, factories and workshops being at a standstill for the time. This stoppage affects the engineering, building and timber trades, and the normal demand for timber falls below the average. Ordinarily a demand above the average would have been expected, for in addition to a fair amount of house building in progress some big building jobs are now proceeding in the Lancashire cotton manufacturing district, new mills and factories being in course of erection. In the last week of the month more activity was noticeable, and the Derby Road railway yards assumed a more exhilarating aspect. The state of these yards is one of the most reliable indications of the extent of the up-country demand. If the demand be good, timber is sent to the yards, trucked and dispatched. If it be slow, the railway companies do not get the stuff. In the last week of August they received boards and logs in larger quantities and passed them on inland.

The Liverpool local demand has been very quiet. The building of house property is not proceeding briskly at present, so that the local demand for joists, flooring boards and fittings is not active. One big job, however, has made a heavy demand for timber, namely, a new hospital at Fayakerley, to the north of Liverpool, comprising seventeen large blocks and eight smaller ones, while the new offices of the Mersey Docks and Harbour Board at St. George's Dock, Liverpool, are just approaching the stage of maximum demand for timber. The Board have other extensive building operations in progress at the new King's docks, and at the north end of the dock estate, but here timber has been completely ousted by concrete and steel. The Board, however, have works of dock construction and extension in hand involving much heavy piling, bulk-heading, staging, staying and counter-staying, for which a good deal of log stuff has been required and will be required: and ere long the Board will commence their new work of dock-construction at the extreme north of the present dock estate, which will involve an expenditure of something like four millions sterling and will create a large demand for log and rough timber.

Deals and Pine.

Deals have been in fair demand, especially of sizes 3ins. by 7ins. and long 3ins. by 11ins.

Canadian pine deals and spruce deals have come to hand in quantities which have more than maintained stocks. Prices have consequently been easy. The arrival of quantities of timber sent on consignment has tended to make buyers indifferent and to keep prices low. Some of the large holders, however, expect prices to harden in view of demands which will probably be made when the effect of the holiday disturbance has passed away.

The arrivals of Quebec pine deals make a shortage for the year as compared with 1903 and 1904, but this has been more than made up by the arrivals of New Brunswick and Nova Scotia spruce and pine deals, which leave the receipts for the present year in excess of those in the corresponding period of 1903 and 1904.

Flooring boards for general use have met with more enquiry, and prices are somewhat higher. Supplies of these boards continue light and stocks of some sizes are very low.

Pitch-pine has come to hand more freely, and the effect of the light arrivals earlier in the year has passed away. There is still, however, a steady demand for this wood, and quay lots have been quickly taken up at fair prices. Sawn timber has been in moderately good demand, boards 15ins. or 16ins. wide especially finding ready buyers. Stocks of planks and sawn wood are still much smaller than the stocks held at the corresponding time last year and in 1903, the shortage in sawn wood especially being great. But there has been more than ample to meet the demand. Log stuff is now the least active. Stocks have been accumulating and are largely in excess of what they were a year ago.

Mahogany

has been in moderate supply, and the stocks offered have found ready purchasers. African, principally, has been received. At the auction sales, lots have been eagerly competed for and high prices have been obtained. A feature of the business at Liverpool is the buying on American account. Buyers attend the Liverpool sales regularly to purchase stocks for shipment to the United States. This ensures a lively interest in the lots being offered and tends to maintain values. Cuban wood which has been available has sold very readily and at full prices. St. Domingo has been in fair supply but has been neglected so that stacks of this wood have increased. Honduras has been enquired for, but practically no wood has been available. Stocks of useful wood coming forward would find ready buyers at good prices. With the supplies of African and Cuban wood which have lately come to hand, and the interest which has been shown in these woods at the auction sales, the mahogany market closes in a healthy and satisfactory state.

Oak

in logs and planks has been received in moderate quantities, and fairly large stocks are now held. Baltic has been in better request, and the supply is now light.

In the other kinds, wood of good quality has been taken up freely, but poorer qualities have not found much favour. Stocks of Canadian and American and of planks are much lighter than they were at the corresponding date in 1904 and 1903, but are ample to meet the present demand.

Ash

continues to be received in small quantities, and stocks are comparatively light. The demand has been but small, so that the stocks in hand have fully sufficed for requirements.

Hickory

is also in small supply, and holders speak of a scarcity before the year is out. The enquiries for this wood do not show any large interest to be taken in it at the present time.

Birch,

in logs, has been in larger request and fair sales have been effected. Planks have sold with moderate freedom. The quantities recently received have been less than the quantities sold. The shortage has, therefore, been made up from stocks. These seem quite sufficient to meet immediate demands, the stock of planks being largely in excess of the stock held twelve months ago. The stock of logs is, however, much smaller.

Elm

has sold more freely, at firm prices, requirements being met out of stocks, which are consequently low.

Teak

has met with a better enquiry and prices have been well-maintained. Stocks are comparatively large, and recent arrivals have been on an adequate scale.

Walnut of good quality has been in demand and has brought full prices. Other

qualities have been neglected and the prices of these are weak.

At the mills, sawing has been on a moderate scale and reports speak of business as being quiet.

An increased movement of heavy log stuff, chiefly mahogany, is now noticeable on Derby Road. This is not ordinary "yarding" but indicates a freer movement of stocks to mills or railway stations, and consequently, improved trade.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Value of an Elm Tree.

HARROW.—A. R. B. writes: "Can you give any idea of the value for timber of an enormous elm tree, and give the name and address of any sawmills in this neighbourhood that would buy it standing?"

We could only make a random shot on such insufficient information. We advise you to write to local timber merchants and sawmill proprietors and ask for bids.

Removing a Church to another Site.

EDINBURGH.—A. L. writes: "I propose to take down a church and to rebuild it on another site near. Can anyone give me an instance of where this has been done successfully with a church or other public building?"

Perhaps some of our readers can furnish information on this subject.

Buildings to Measure near Keighley.

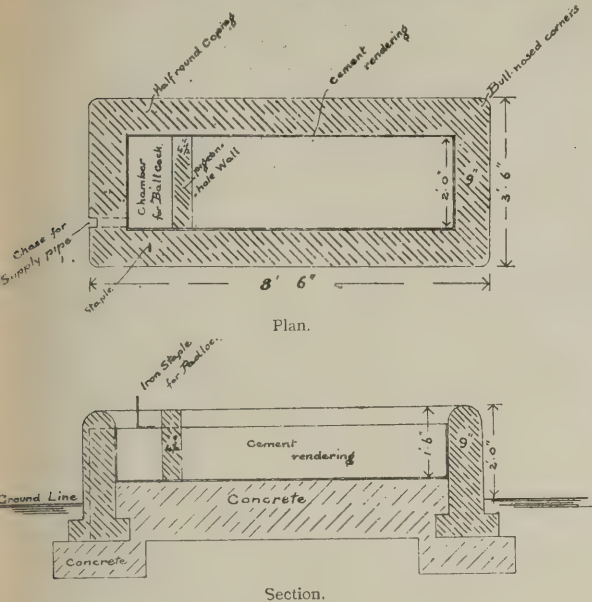
KEIGHLEY.—STRAD writes: "Kindly name any buildings of architectural interest suitable to measure in the neighbourhood of Keighley—taking a twenty-mile radius."

Suitable features will be found in the following list of buildings from which to make measured drawings:—Kirkstall Abbey, which is chiefly Transitional Norman and Perpendicular; Bingley Church, Perpendicular; tower of Haworth Church, Perpendicular; Kildwick Church, Perpendicular; St. Peter's Church, Bradford, Perpendicular with parts Early English; St. John's Church, Halifax, Perpendicular and Early English; Skipton Church, Perpendicular; Barnoldswick Church, Perpendicular and Early English; Shipley Church, Perpendicular; Ilkley Church, Decorated and Early English; Bolton Abbey, Decorated and Early English; Guiseley Church, Norman, Transitional Norman and Early English; Otley Church, Norman, Transitional Norman and Perpendicular. The following Renaissance buildings are also within the prescribed radius:—Calverley Hall and Horsforth Hall, both of the Jacobean period; Bowling Hall, Elizabethan; Bierley Hall, dated 1676; and Kildwick Grange and Hall, seventeenth century. H. Y. M.

Competitions.

Perth City Hall.—Between thirty and forty designs have been submitted for the rebuilding of the City Hall at Perth. A meeting of the committee is to be held at an early date, when an assessor will be appointed.

Holy Trinity Church, Failsforth, near Manchester.—The competition for this church, to cost £5,000, has been decided in favour of Mr. R. K. Freeman, of Bolton; the second place being awarded to Messrs. H. & W. Wade, of Blackpool and St. Anne's-on-Sea.



A CATTLE TROUGH.

By G. S. Mitchell, F.S.I.

A DRINKING trough for cattle in yards or pastures is shown on this page. It consists of gin. brick walls built in cement with concrete foundations and lining, and coped with half-round bricks with cement angles and bull-nosed corners.

The interior is cement rendered, and a $4\frac{1}{2}$ in. wall, pigeon-holed in about half a dozen places, shuts off the chamber containing the ball-cock of supply-pipe. This wall should be built after the cement rendering has been performed, or it will be difficult to keep the trough watertight.

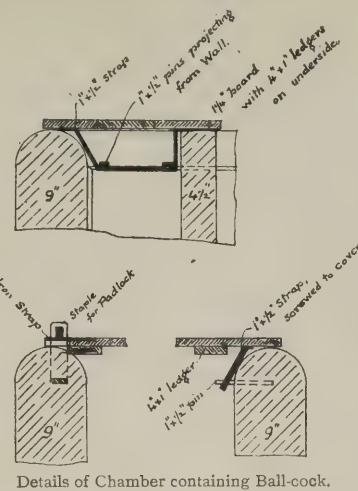
The ball-cock is guarded against injury or mischief by a $1\frac{1}{2}$ in. wooden cover (as figure) composed of narrow boards with $\frac{1}{4}$ in. by $\frac{1}{2}$ in. ledgers on the underside, secured at the one end of the trough by two $\frac{1}{2}$ in. by $\frac{1}{2}$ in. iron pins (built into the brickwork just under the cope), which engage with an iron staple $\frac{1}{2}$ in. by $\frac{1}{2}$ in. fixed on the underside of covering board. An L-shaped $2\frac{1}{2}$ in. by $\frac{1}{2}$ in. iron staple built in at the opposite side of the trough fits into a slot in the board, which is there secured by a padlock.

The supply-pipe is brought up the end of trough in a chase formed for the purpose—the stand-pipe is most conveniently fixed before the brickwork—two bends just carry the pipe over the wall (one cope being left out for the purpose) and the ball-cock is connected at about 6 ins. from the end of the trough, and so lies across the centre of the chamber.

Should there be no danger of the stock being left without water, or if a ball-tap be objected to on account of its possible leakage, the feed need not be automatic, and the supply-pipe should in that case be brought up and over the wall in exactly the same way, a small brick just formed in the ground close to the outside of the trough and a substantial screw-down valve—with relief cock to enable the stand-pipe to be emptied in case of frost—fixed in it. A small wooden cover with lifting ring completes the arrangement.

If a trough be placed in the fields it should be so situated that live-stock may get all round it and water with ease. Horned cattle are very likely to injure one another if it be not so arranged.

It is sometimes desirable to place such a trough so as to serve for two fields, and in that case I have found it best to set the trough with its length in the direction of the fence, with a rail over it about 16 ins. above the top of the cope.



A DRINKING TROUGH FOR CATTLE.

BUILDING CONTRACTS IN JAPAN.

IN Professor Hearn's recently published work on Japan he makes the following interesting statement in relation to the methods of use in building operations in the empire of the Mikado:—

"Let us suppose, for instance, that you wish to have a good house built. For that undertaking you will have to deal with a very intelligent class of skilled labour; for the Japanese house carpenter may be ranked with the artist almost as much as with the artisan. You may apply to a building company, but as a general rule you will do better by applying to a master-carpenter, who combines in himself the functions of architect, contractor and builder. In any event you cannot select and hire workmen; guild regulations forbid. You can only make your contract; and the master-carpenter, when his plans have been approved, will undertake all the rest, purchase and transport of material, hire of carpenters, plasterers, tilers, mat-makers, screen-fitters, brassworkers, stone cutters, locksmiths and glaziers. For each master-carpenter represents much more than his own craft guild; he has his clients in every trade related to house building and house furnishing, and you must not dream of trying to interfere with his claims and privileges."

Bound to One Builder for Life.

"He builds your house according to contract; but that is only the beginning of the relation. You have really made with him an agreement which you must not break, without good and sufficient reason, for the rest of your life. Whatever afterwards may happen to any part of your house, walls, floor, ceiling, roof, foundation, you must arrange for repairs with him—never with anybody else. Should the roof leak, for instance, you must not send for the nearest tiler or tinsmith; if the plaster cracks you must not send for a plasterer. The man who built your house holds himself responsible for its condition, and he is jealous of that responsibility; none but he has the right to send for the plasterer, the roofer, the tinsmith. If you interfere with that right you may have some unpleasant surprises. If you make appeal to the law against the right, you will find that you can get no carpenter, tiler or plasterer to work for you at any terms. Compromise is always possible; but the guilds will resent a needless appeal to the law."

At Holy Trinity Church, Nottingham, a Gothic reredos of Austrian oak has been erected as a memorial.

Correspondence.

The Expansion of Concrete Floors in Buildings.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—An interesting and important discussion has been going on lately in your paper to which I should like to be allowed to add a few words.

Your correspondent "A. H." speaks of cases wherein concrete floors in which furnace ashes had been used as the aggregate, and in which mischievous expansion had taken place.

Another correspondent, writing a few weeks earlier, describes the same sort of thing, also with the use of furnace ashes mixed with the cement; while in that case some of the same cement mixed with clean sand and subjected to the glass-bottle test showed no expansion at all. Surely this is reasonable proof that the injurious expansion was caused not by any fault in cement, but by the chemical combination of one or more of the by-products in the furnace ashes producing a compound which expanded and so caused the mischief.

It is quite obvious that furnace ashes must be always liable to the possession of various and obscure compounds. They must always contain sulphur in some form or other—a very active chemical agent. Also every kind of refuse is thrown into a fire with results that cannot be known or foreseen.

Having had a long experience in dealing with concrete floors I have found that wherever mischievous expansion has taken place, in every case without exception, the aggregate has been furnace ashes. Surely, with this fact in view, it is the part of wisdom with builders to avoid this cheap but dangerous and untrustworthy material! Clean river ballast or broken stone are much safer materials, and where the floors are being put into large and costly buildings, as is so much the case at the present day, why for the sake of cheapness use a material that may bring so much trouble in its train!

Now that the new ferro-concrete is coming so much into use, it is most important to those who are responsible for the work to secure the very best materials for it, as the whole is liable to failure if the materials employed are not of the best procurable.

Having said something about the aggregate, may I now add a few words about the cement. It is sometimes erroneously supposed that cement may be and has been made which has no expansion at all. This is not the case, unless the cement has been kept so long as to have lost its most valuable cohesive properties. The recently issued "Standard Specification" for cement, as prepared by the Committee of the Institution of Civil Engineers, assisted by technical experts, expressly provides for a small measure of expansion, but limiting it to a prescribed figure. Until comparatively recent times no Portland cement would have complied with this severe limitation, and it can only be arrived at by very accurate mixture of the raw materials, by their extremely fine reduction, by good burning and careful rejection of any underburnt portions, and by fine grinding of the resultant clinker. When cement has been prepared in this way it is immediately ready for use, and can be relied on to do good work without fear of mischievous expansion.

The more perfectly these processes of the manufacture are performed by the manufacturers the better will the cement be. In compliance with the demand for the highest quality, the Associated Portland-cement Manufacturers have lately produced a cement which is sold under the name "Ferrocrete," which has been expressly made for ferro-concrete work. Its production is characterized by great care in all the processes

indicated above—it has the highest measure of tensile strength coupled with the lowest measure of expansion—in the latter case far below that prescribed by the "Standard Specification."

It has been used by the most eminent London builders in concrete floors, in ferro-concrete construction, as well as in concrete piles, with the best results. The writer believes that in the use of such cement, coupled with the absolute avoidance of furnace ashes, concrete floors may be put into large and costly buildings without any of the deleterious results that have sometimes made their appearance when less care has been exercised in the selection of the materials.

—Yours truly, CONTRACTOR.

LONDON.

[At the end of Mr. Thomas Potter's letter on this subject in our issue for last week by a printer's error a coke-breeze concrete pier is stated to have crushed with 205·7 lbs. per sq. inch instead of 2,057 lbs.—Ed. B.J.]

An interesting communication by Mr. Benjamin Hannen, junr., for Messrs. Cubitt & Co., whose great experience as contractors for reinforced concrete work is so well known, was published recently in the "Journal of the Royal Institute of British Architects" on the subject of Portland cement for reinforced concrete, and may be opportunely referred to in connection with the above letter. Mr. Hannen states that before giving an order for cement Messrs. Cubitt & Co. enquire as to the standing of the manufacturers, and see that there is a well-fitted laboratory and a staff of experts, and that samples of the mixture are taken at frequent intervals and analysed in order to ascertain whether the substances are present in the right proportions.

If the results of the enquiry were satisfactory they would sooner trust the cement coming from such a firm, without any tests whatever, than accept a new cement which had been tested only as neat cement for seven days.

When the cement ordered reaches the job, a sample is taken and forwarded for testing in Messrs. Cubitt's own laboratory. They first of all ascertain the apparent density in this way: they find the weight of a litre of cement, obtained by filling a standard litre measure with the cement by means of a standard apparatus. The weight of the litre of cement gives a number that tells the relative weight of cement under the given conditions to water; consequently, if the number indicating the weight of a cubic foot of water, 62·4 lbs., is multiplied by the number indicating the apparent density, the weight of a cubic foot of the cement is obtained. Their cement has to be delivered to the job in bags containing a certain specified weight of the cement; the bags are carefully weighed on delivery, and any errors that may be found are corrected. The cement contained in one bag is used as the unit in mixing the concrete. Knowing the weight of a cubic foot, and also the proportion in volume of the cement to the aggregate, it is easy to make a gauge-box containing the exact cubical contents for apportioning the aggregate to the cement by weight. By this means every gauge is practically of exactly the same proportion—a result that is impossible if the cement is mixed by measure.

Specifying the weight of a bushel of cement should be entirely given up; the variations in weighing so large a quantity as a bushel as ordinarily carried out are too great. It is essential that the determination of the apparent density should always be made on the same volume. Messrs. Cubitt & Co. attach very great importance to the apportionment of cement for concrete by weight instead of by measure. It is of importance to note that the better the cement the lighter is its apparent density, the specific gravity being at least 3·0. Having found the ap-

parent density, they next ascertain the fineness. The fineness should control the apportionment of cement by weight; if this is done the special quality of the cement will have to be considered, for it will not be necessary to use so much in weight of the best quality cement as of that of an inferior quality. "Take, for example, two good cements that we have lately experimented upon:—

Apparent density.	Residue on Sieves.		
	50 x 50 2,500 meshes per sq. in.	76 x 76 5,776 meshes per sq. in.	180 x 180 32,400 meshes per sq. in.
A. '915	none	none	5·15 per cent.
B. 1·282	none	none	34 per cent.

If the cement be apportioned by weight, then 915 tons of A. will be equal in cementitious value to 1,282 tons of B., thus giving a difference of 40 per cent. in favour of A."

They next test the setting. Generally in specifications the time is mentioned, but no reference to temperature is made. To show the influence of temperature on setting, the same cement that set in two hours in a temperature of 75 degs. Fahr. took, nineteen hours in a temperature of 34 degs. Fahr., and proportionately between. Messrs. Cubitt also test for tensile and compressive strength, and by boiling.

Trade and Craft.

Modern Sanitation.

Under this title the Standard Sanitary Manufacturing Co., of Pittsburg, New York and Chicago, whose London address is 22, Holborn Viaduct, issue (gratis) a monthly magazine. The primary object is, of course, to make the company's wares better known, and though the United States cannot teach us much in the way of sanitation it cannot be denied that their fittings are in every way equal, if not superior, to what we can produce. The magazine referred to is well illustrated and printed, and contains information of a practical value to the plumber. The firm inform us that they will be pleased to forward copies of the magazine to any plumbers who make application.

"Anduro" Roofing.

There are numerous materials for roofing now upon the market, all of which have their special advantages, besides that of tending to reduce the cost of construction. The manufacturers of the "Anduro" roofing, for which Messrs. Hickie, Borman & Woods, Ltd., of Coronation House, 4, Lloyd's Avenue, London, E.C., have been appointed sole selling agents in the United Kingdom, claim several special features for the material which should render it particularly valuable. This material can be used either for roofing, damp-course or as a substitute for linoleum, and it has the advantage of being waterproof, air-tight and light in weight. Moreover, it does not contain any obnoxious ingredients, and remains in good condition without requiring painting or other means of preservation. Further, it is not affected by change of temperature or climate, and as it is a bad conductor of heat, buildings covered with it remain cool in summer. The material is made in five thicknesses.

Asphalt.

There is much confusion in the minds of the profession generally as to the nature of asphalt, and the trade firms connected with the industry have generally been content to allow this mystification to continue, in order that they might be free from any supervision. There has been a good deal of sharp practice, and some smaller firms without a reputation have done work that is most unsatisfactory. The French Asphalt Co. deserve commendation therefore for the publication of an interesting little pamphlet upon the subject, which should help to dispel a good many of the

fallacies that are current. The terms asphalt and asphaltum have been used vaguely to denote (1) bitumen or natural pitch; (2) substances impregnated with bitumen; (3) pitches produced artificially from the residuum oils of naphtha and petroleum, shale grease, animal fat, coal tar and Stockholm tar; and (4) tar concrete or tar macadam, a paving material composed of gravel or broken stone and coal tar. It should be clearly understood that bitumen or natural pitch is not asphalt, although it is one of its principal ingredients. Asphalt is a distinct natural product, like coal, and may be divided into two varieties, limestone impregnated naturally by bitumen, and bitumenised sandstone. It is only the first that is at all valuable for paving purposes. The pamphlet published by the French Co. puts the matter plainly when it says that "Tar-paving is not asphalt; British asphalt is not asphalt; Trinidad pitch is not asphalt; and the many concoctions and compounds labelled 'asphaltic this' or 'bituminous that' are not asphalt." The following is a chemical analysis of the asphalt from the French Asphalt Co.'s freehold mine at St. Jean-de-Maréjols, in the department of Gard, France:—

Bitumen	-	-	13·60
Carbonate of lime	-	-	85·00
Silica	-	-	·60
Oxide of iron	-	-	·20
Alumina	-	-	·10
Moisture	-	-	·30
Loss	-	-	·20

100'

The company are not over-stating the case when they say that the asphalt which has given the best results for paving purposes comes from France or Switzerland. There are very large deposits in Sicily, but the rock is of a sandy nature, while as regards German asphalts the following caustic remarks are made:—

"Many good things come from Germany and a great deal of asphalt, but the asphalt is not one of the good things. In Berlin, where more asphalt has been and is laid as pavements than anywhere else in the world, the only asphalt not allowed to be used is German asphalt. Not being wanted in Germany the German asphalt is shipped largely to England, but it is avoided by the wise. Berlin has more than 200,000 metres of its principal streets paved with French asphalt, supplied and laid by the French Asphalt Co. of London."

The pamphlet gives a good deal of information as regards the preparation and methods of laying asphalt, and we are glad to see that the company frankly admits that compressed asphalt needs constant traffic to keep it hard, and is therefore only suitable for pavements on which there is a constant stream of passengers or on roads subject to heavy traffic. For cases where compressed asphalt is unsuitable the company makes a special mastic asphalt, which is composed of the asphalt rock, with Trinidad bitumen added. This mastic asphalt is cheap, though quality has to be paid for, and no attempt can be made to compete on the question of price with mastics composed of naturally inferior materials. The following is a list of a few of the purposes to which mastic asphalt has been put by architects and engineers: Damp-courses (flat and vertical), roofs, gables, gutters, basement floors, stable paving, piggeries, cellars, vaults, tun-rooms, swimming baths, garden paths, reservoirs, granaries, lawn tennis courts, racquet courts, electric-cable troughs, insulation of all kinds, batteries.

The pamphlet concludes with a specimen specification for work in mastic asphalt that will be very useful. The address of the French Asphalt Co., Ltd., is 5, Laurence Pountney Hill, London, E.C.

Keystones.

Brentford Fruit and Vegetable Market is being extended at a cost of £50,000. The extensions cover 12 acres.

Mr. W. L. Griffiths, architect, has removed his offices from Oswaldestre House, Norfolk Street, to Oakley House, Bloomsbury Street, London, W.C.

A new Railway Station at Newburgh is to be erected. It will be much larger than the present one, and will depart from the custom in Scotland of using stone, a pressed brick being the material chosen.

Glasgow School of Art.—The syllabus for the next session has just been issued. A separate calendar of the School of Architecture gives the full curriculum of this section of the school and can be had on application to the secretary.

Cost of Cleansing and Lighting the City Bridges.—The cost of lighting, cleansing and repairing the four bridges across the Thames within the City was as follows last year:—London Bridge, £1,199; Blackfriars Bridge, £2,914; Tower Bridge, £15,814; Southwark Bridge, £1,066.

Brereton Church, Cheshire, has been restored. The church, which was built in 1450, was noted for its magnificent carved-oak panelled ceiling, but as a result of the ravages of the oak beetle this became unsafe. At a cost of something like £2,000 the ceiling has been replaced by an almost facsimile of the old roof.

A new Workhouse Infirmary at Otley is being constructed of Guiseley stone at a cost of £8,571. The woodwork in the interior is to be of pitch-pine, and the lower part of the interior walls will be tiled, with the corners rounded so as to prevent any accumulation of dust. Mr. W. H. Herbert Marten, of Bradford and Menston, is the architect.

Fire-resisting Corporation, Ltd.—This reconstruction of the old Non-flammable Wood and Fabrics Co. shows in its annual report for the past year a profit of more than £5,860, as compared with a loss of £4,700 made by the old company in 1903. No dividend, however, will be paid, as it has been found necessary to erect a new drying kiln and also to purchase more machinery.

A Mosque for London.—The idea of erecting a mosque in London appears to be maturing to a definite result. The design of Messrs. Chambers & Martin has been submitted to the Shah of Persia and has met with his approval. Mr. Chambers was the architect for the little mosque at Woking which elicited such high commendation from the Shazada when he visited it during his stay in this country.

A new Roman Catholic Church at Garston has been erected at a cost of £8,160. The building is of red Woolton stone with Accrington dressings. The roofs are covered with brindled tiles, and the building is warmed by low-pressure hot-water pipes and lighted by electricity. The architect was Mr. D. Powell, of Liverpool, and the contractors were Messrs. R. Wearing & Sons, of Liverpool; the clerk of works being Mr. E. Quirk.

New Tredegar Estate Offices have been erected at Pentonville, Newport, by Messrs. A. S. Morgan & Co., contractors, of Newport. The electric lighting and hot-water heating apparatus have been installed by Messrs. R. Alger & Sons, of Newport. The sanitary fittings are by Messrs. Doulton, of Lambeth; the lift by Waygood, Ltd., of London; the strong-room doors by the Ratner Safe Co., London; and the stable fittings by Musgrave, of Belfast. The exterior walls are of local stone faced with Chilmark freestone from quarries at Tisbury, Wilts.

Antrim County Courthouse is to be enlarged, and the tender of Messrs. R. Corry, Ltd., for £11,958, has been provisionally accepted. The plans have been prepared by Messrs. Young & Mackenzie.

A new Church at Norbury has been built in an octagonal shape with gallery. There are no pillars to obstruct the view, and no pews have been introduced. Tip-up seats are employed in the auditorium and the gallery.

Magnetic Observatory Buildings, Eskdalemuir.—A start will shortly be made with the erection of these buildings. The site is a very isolated one, and materials will have to be transported for miles by carts. Mr. W. T. Oldrieve, architect, H.M. Office of Works, Edinburgh, has prepared the plans.

"More Famous Houses of Bath and District."—Messrs. Meehan announce the early publication of this work, which will be a companion volume to "The Famous Houses of Bath and District," published so successfully in 1901. Its price will be 10s. 6d. nett, and the edition will be limited to 500 copies.

The Pavilion at Dunoon, opened by Princess Louise recently, faces the sea and has a row of shops in front with reception-rooms above, and at the back an octagonal-shaped assembly hall (with stage) capable of accommodating nearly 4,000 people. Originally the cost was to be £6,000, but the figure will now be fully £10,000.

Berry Pomeroy Church is to be further restored. The restoration scheme was commenced in 1878, when alterations costing about £3,000 were carried out. It is now considered necessary that some repairs should be done to the roof of the building, and also to restore the tower, whilst further restoration of the fifteenth-century screen is needed.

The Alexandra Theatre, Greenock, has been completed. The balconies are cantilevered, only two steel pillars being used in the auditorium. The auditorium measures 49ft. wide at the narrowest part and a little over 60ft. at the widest, and the distance from the curtain to the back wall of the pit is about 77ft. The height from stage level to roof at back of gallery is 56ft., and from stage front to ceiling at bottom of dome measures 40ft. A complete installation on the Reck system is supplied for heating. The theatre has seating capacity for about 2,000. The architects were Messrs. Boston, Menzies & Morton, of Greenock, and the contractors Messrs. Forrest & M'Leod, of Glasgow.

The Repair of Canterbury Cathedral.—The whole of the south face of the tower of Canterbury Cathedral has now been strengthened and solidified, and all dangerous parts effectively removed. The condition of the stonework has proved to be more serious than anticipated. In many places concealed fissures unexpectedly disclosed themselves, entirely filled with vegetable and animal life, the face of the stone often being separated from the core, and only kept in place in the most precarious manner. In one place an area was found of about six consecutive yards of continuously detached surface; and this mass of loose stonework was bound to have fallen ere long with disastrous effect. The buttresses prove not to be in all cases as solid as might be wished, large portions of them being cored with flint rubble. One of them was found to be split away from the main fabric from top to bottom, while, in another, sixteen courses of masonry were found to be without bond, sustained only by a slender and much decayed piece of stone. Work on the west side has just been commenced. Where possible the decayed stonework has been treated with baryta water. The entire work is estimated to cost £14,000. Mr. W. D. Caröe has the direction of it.

A new Roman Catholic Church for Stirling has been designed by Messrs. Pugin & Pugin, of London. The building is to seat 1,000 and will cost £12,000. It is of Decorated Gothic style, with nave, aisles, chancel and side chapels and ample sacristies.

New L.C.C. School of Arts and Crafts.—Plans are being prepared by the architect of the London County Council for the new Central School of Arts and Crafts, to be erected in Southampton Row, at an estimated cost of £73,700. The building operations will occupy two years and will be carried out by the Works Department.

Penistone District Isolation Hospital was opened recently. A scarlet-fever block has accommodation for eight beds, four for each sex, together with a nurse's duty-room, bath-room and convalescent room. The typhoid-fever block has accommodation for four beds, two for each sex, together with rooms as in the scarlet-fever block. Another block consists of washing and drying rooms.

Tarmac, Ltd.—By virtue of a special resolution of the Tar Macadam (Purnell Hooley's Patent) Syndicate, Ltd., to which the consent of the Board of Trade has been duly obtained, the name of that company has been changed to "Tarmac, Ltd." The registered office of the company is Spring Vale, Ettingshall, near Wolverhampton.

Mr. Stirling Lee and St. George's Hall, Liverpool.—The Liverpool City Council will to-day consider a letter from Mr. T. Stirling Lee in which the sculptor asks to be allowed to finish his life's work on the panels of St. George's Hall, Liverpool, whilst still in his best days. Should the Council not see its way clear to expend the small sum of £1,000 a year for six years, he then hopes there may be some citizen who will come forward to finish one part of "the finest modern building in Europe."

The Painted Hall at Greenwich has been thoroughly cleansed and renovated, with the exception of the ceiling, which was treated about twenty years ago. Many unsuspected details of Sir James Thornhill's paintings have been brought to light. A great improvement has been effected by the taking out of two "blind" windows in the upper hall and filling them with clear glass. The pictures have been thoroughly overhauled and rearranged by Mr. W. F. Yeams, R.A., the curator.

East London College.—The 1905-06 calendar of this college, which is situated in the Mile End Road, has just been issued. The Governors have decided to add an Arts site to the college course, and arrangements have been made for providing instruction for the arts examinations of the University of London. In this connection six scholarships—three for men and three for women—of the value of £40 per annum for three years, will be awarded on the result of the London Inter-Collegiate Scholarship examinations in Arts subjects to candidates between sixteen and nineteen years of age on October 1st, 1906.

An Architectural Impasse.—Architects have oftentimes difficulty in reconciling plans submitted by two parties. A gift by Mr. Caird of £16,000 to add a physical laboratory to the University College at Dundee led to the donor instructing his own architect to prepare plans for the block. The college council did not consider that the architect had kept in view the desire to have a homogeneous scheme of building for the college as a whole, and they asked Sir Rowand Anderson, who designed the new University buildings at Edinburgh, to advise. He suggested certain amendments on the plans prepared, but Mr. Caird, who disapproves, has now intimated that he may withdraw his gift.

STAINING SHINGLES.

American Methods Explained.

SHINGLES are not used to such a great extent in this country as they are in America, where they are almost invariably painted or stained. The latter is considered to be the most practical method of finishing them, and a few notes on the American practice may, therefore, be of interest.

When a shingle roof is painted it is almost impossible to avoid having some of the paint run down between the shingles, forming little dams that will hold back some of the water from every rainstorm, and this water will soak in through the edges of the shingles and will frequently cause them to rot. As a matter of fact, painting a shingle roof does not prolong the life of the roof at all, but tends rather to shorten it. Shingles that are left bare of finish will usually outlast a painted shingle roof. If however the shingles were dipped in paint before they were laid, then this objection would be overcome; but while such a method of finish would answer very well for a time, when renewal became necessary it would be impossible to avoid getting some of the paint into the spaces between the shingles.

Shingle stains not only offer a safe and convenient method of colouring shingles, but they are decidedly artistic, by reason of their soft effect, and also from the fact that the stain does not act absolutely uniformly on every shingle, nor indeed on every portion of the same shingle; hence there is a very pleasing play of colour upon the surface, although the general effect is uniform.

Varieties of Stains.

The two principal varieties of shingle stains are oil stains and creosote stains. The first consists of linseed oil with enough of the ordinary pigment tinting colours mixed with it to colour the wood, and a certain amount of drier. In other words, oil stains are a very thin paint used for dipping purposes. Even if they are brushed on, the body of the stain is not sufficient to cause dams of paint. Any painter can mix a satisfactory oil stain. The best colours to use are the non-fading earth pigments, such as umber and sienna, ochre, Van Dyke brown, Venetian red or lampblack.

Creosote v. Oil Stains.

Although anyone can mix a shingle stain using creosote as a vehicle, the term "creosote shingle stains" is a trade-mark and can be used only by the manufacturer who first introduced them. The advantages which creosote stains possess over oil stains is that they penetrate more deeply into the wood, and being very slow to dry, last longer. For this reason they protect the shingle better against dry-rot. Moreover, when shingles are dipped in creosote stain before laying, and are given another coat of the stain with a brush after being laid, mildew or fungus growth cannot establish itself upon the surface of the shingles, as is the case with oil stains having pigments of a mineral or earthy base.

A stain made from inert pigment, ground in oil, thinned with pine-tar, liquid drier and benzene or kerosene has been known to hold its colour well after an exposure of four years.

At the convention of the Ohio Association of Master-Painters and Decorators, held in Cleveland in 1903, the subject of shingle stains was discussed at some length. A well-known Toledo painter recommended a stain made from 2 gallons of coal oil (kerosene) to 1 gallon of raw linseed oil, tinted to any shade or colour desired. This he said would wear as well as any manufactured stain on the market, and would cost about one-third as much. Another member stated that he had mixed some shingle stain, using 1 lb.

of beechwood creosote to one barrel of crude oil and a small percentage of drier to prevent the colour from running. This was tinted with the best quality of pigment colour that could be bought, and the shingles dipped into this stain had held their colour for twelve years.

Ordinary linseed oil paints, thinned with benzene, have been recommended for shingle staining, but are not advisable, for although the colour holds out well the shingles are apt to show evidence of dry-rot.

Skilled labour is not necessary for dipping shingles. All that is needed is to have a large tub to hold the stain, which must be stirred every few minutes to prevent the pigment settling. Into this stain the shingles are dipped for not less than two-thirds of their length, and are then stood on end to dry, or rather to drain. The painters' unions, however, claim this to be painters' work, although any boy or handy man can do it. The second application of the stain, after the shingles have been laid, requires the services of a painter.

MINTO HOUSE.

How Plans and Details were Prepared 100 Years ago.

MINTO HOUSE, near Hawick, the Scottish home of the newly-appointed Viceroy of India, possesses a number of interesting features. The architect's name has been lost, though an old volume of the original plans of the house exist. These are neither signed nor dated, but are curious as showing the manner in which the working plans for a large house of about 130 years ago were prepared. The drawings are to the scale of $1\frac{1}{4}$ in. to 10 ft., with a few elevations of the sides of rooms, and plans of ceilings to $\frac{1}{4}$ in. scale. On the same sheets as the scale drawings, and sometimes on the back, are drawn in a scratchy ink-line full-size details of cornices, balustrades, Ionic caps, &c. For a Classic house the plan is unusual, being an L plan with a segmental portico partly filling the re-entering angle. This portico admits into a hall; on either side of which, and running the reverse way, are subordinate halls. The main hall again opens at the end into a circular hall containing a stair, and surrounded on the first floor by an arcaded gallery giving access to the bedrooms and bedroom corridors. On ground floor the circular hall opens on the one side into a large library and on the other side into an interesting octagon drawing-room with lofty coved ceiling. The interior, though not containing any works of art of remarkable importance, has that atmosphere which only generations of refinement can give. Since the return of Lord Minto from Canada the house has undergone extensive alterations and additions under the supervision of Mr. R. S. Lorimer, A.R.S.A., of Edinburgh. Electric-light has been installed throughout, the house has been heated, a large number of bathrooms introduced, and the kitchen and service wings of the house rearranged and rebuilt. Outside, an extensive sloping lawn has been altered and formed into a terraced garden with stone balustrades and steps.

A Roman Villa has been unearthed in the neighbourhood of West Meon, Hants. At present three rooms have been laid bare. In the first the flooring of tessellated pavement is remarkably perfect and unbroken. The design can be traced with ease. Blue, white and red are the chief colours employed, and there is an elaborate border and a central ornament of a circular and involuted design. The second room was apparently tessellated chiefly in white, but in the third the remains of a handsome border, mainly in black and white mosaic, can be seen.

Law Cases.

Charges against a Builder.—At the Norton (Malton) Police Court last week Anthony Lyons, of St. Peter's House, Norton, a well-known large builder and contractor, was charged with four offences under the Bankruptcy Act of 1869, namely, not disclosing, not delivering, concealing and fraudulently removing certain goods, the property of his creditors, on or about April 27th last. It was stated that during bankruptcy proceedings Lyons made the declaration that he had handed over the whole of his property and that he had concealed nothing, but it was ultimately discovered that about the time that he was calling his creditors together a large quantity of furniture and other goods had been removed from his house and concealed in the houses of some poorer neighbours, and also in a large barn or outhouse belonging to a neighbouring tradesman. The goods still remaining realized £146. At length Mrs. Lyons handed the trustee a key of the outhouse, and said that he would there find a lot of furniture but the greater part of it was her daughter's. The trustee seized this, and by auction it realized £61 3s. 9d. The gross assets of the estate were estimated at £2,857 13s. 9d., but the trustee said this would not be realized. The total amount of securities held by the creditors was £14,075, Lyons having carried out some big contracts. The Bench committed Lyons for trial at the next quarter sessions.

Contravening the By-laws.—George Taylor, of Camberley, Surrey, was recently summoned at the Wood Green Petty Sessions for contravening two of the building by-laws of the Southgate District Council. One of the offences was in respect of the thickness of the walls of two houses. The by-laws provided that if the building comprised more than two storeys the walls should be 13½ ins. thick below the topmost storey and 9 ins. thick above it. The topmost storey was defined in the by-laws as being the uppermost storey of a building, whether constructed partly or wholly in the roof or not or adapted for human habitation or not. A plan was submitted by the defendant, which received the approval of the Council, showing buildings of three storeys—ground, first and attic floor—with the wall 13½ ins. thick up to the topmost storey. Instead of this a wall of 9 ins. had been erected. The second summons alleged that the defendant had not carried up the wall of one of the buildings so as to form a parapet. It was stated that the by-laws required, for the sake of protection from fire, that there should be a parapet where a building was erected within 15 ft. of another building, but this was not insisted upon except where the space was less than 10 ft., the Model By-laws of the Local Government Board only compelling a parapet to be provided when one house was erected within 10 ft. of another. The defendant's plan showed a building about 10 ft. away from the house he proposed to put up, and the council would not have insisted upon the parapet being built if the plan had been complied with. But the house as erected was only 6 ft. 9 ins. apart from the other. In regard to the first offence it was contended for the defence that there were not three floors comprised within the walls, but the Bench decided otherwise. The second offence was not disputed, defendant stating that he was misled by a notice he received from the Council. Defendant had rendered himself liable to penalties amounting to £280, but on his undertaking to alter the buildings so as to comply with the by-laws the magistrates only fined him £5 and costs. They directed that the alteration must be carried out within two months.

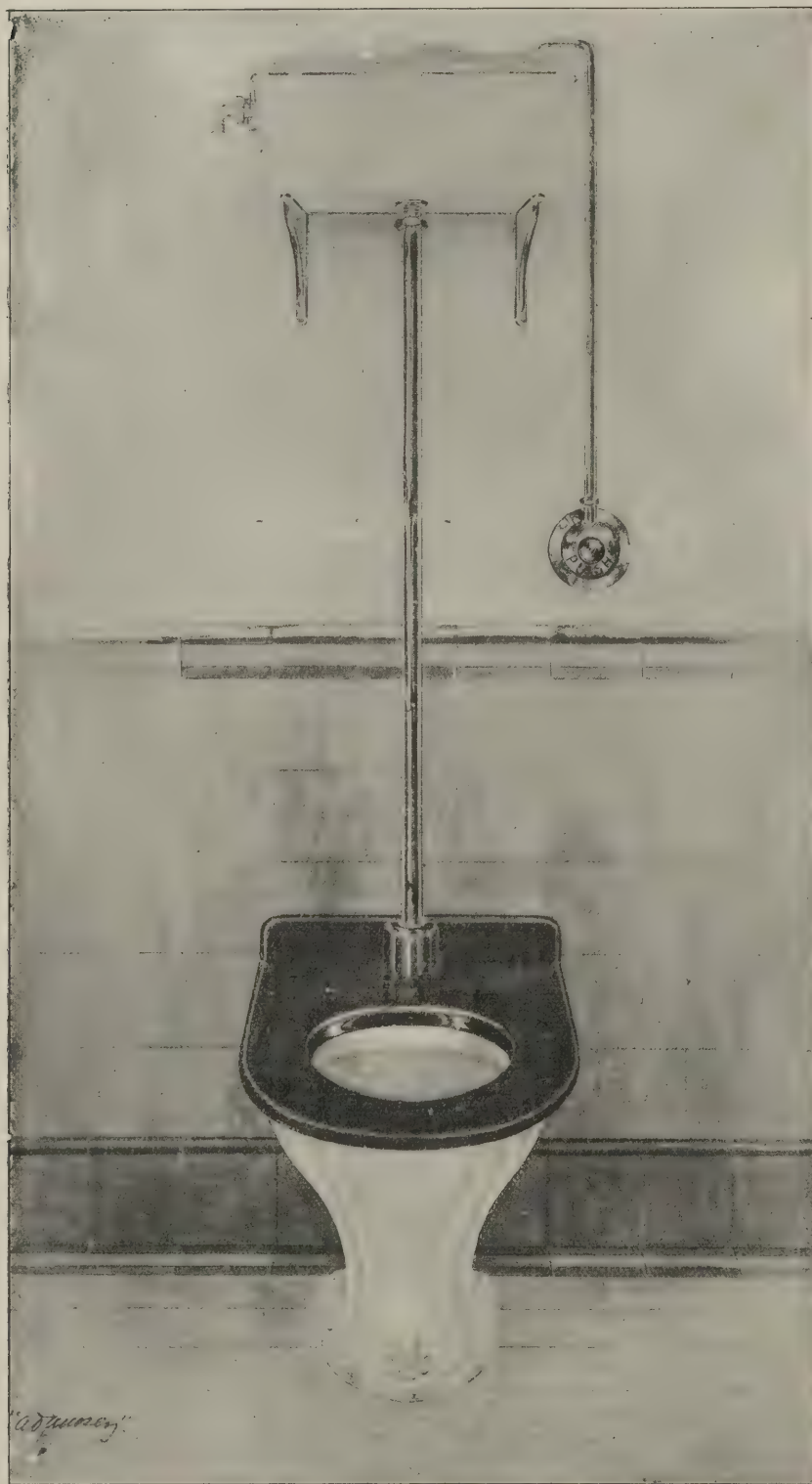
Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
Sept. 7	Croydon—School	Education Committee	J. Smyth, Clerk, Education Offices, Croydon.
7	Dinnington—Schoolroom	Trustees	Rev. H. Jones, Prospect Villa, Kiveton Park, Dinnington.
7	Bottom—Cottages	—	J. Sansom, Architect, Greenbank Lane, Liskeard.
8	Barry, Glamorgan—Coastguard Buildings	Admiralty	Civil Engineer, H.M. Dockyard, Pembroke Dock.
8	Waterford—School	Technical Instruction Committee	Secretary's Office, Town Hall, Waterford.
8	Chisleton—Houses	—	G. Martin, Chisleton, Wilts.
8	Hereford—Boiler-house, &c.	Guardians	W. W. Robinson, Architect, 10 King Street, Hereford.
8	Barnsley—Chapel Alteration	—	G. Moxon, Architect, 25 Church Street, Barnsley.
8	Chatham—Bath-room, &c.	—	County Architect, 86 Week Street, Maidstone.
9	Yeovil—Alteration to Schools	Education Committee	Samson & Cottam, Architects, 1 Hammet Street, Taunton.
9	Penarth—Alterations to Police-station	County Council	Glamorgan County Offices, Westgate Street, Cardiff.
9	London, N.—Cloakrooms	St. Pancras Borough Council	T. W. Aldwinckle, 20 Denman Street, London Bridge, S.E.
11	Lydney—School	Education Committee	M. H. Medland, Architect, 15 Clarence Street, Gloucester.
11	Ipswich—School	Education Committee	E. T. Johns, Thorongfare, Ipswich.
11	High Wycombe—School	Town Council	Borough Surveyor, Easton Street, High Wycombe.
11	Finsbury—Convenience	Council	Borough Surveyor, Finsbury Town Hall, Rosebury Avenue, E.C.
11	Bargoed—Cottage, &c.	—	Surveyor's Office, Knaresborough.
11	Knaresborough—Cattle Market	Council	F. Hayes, Architect, 24 Nassau Street, Dublin.
11	Brow Head, Ireland—Houses, &c.	Lloyd's	County Architect, 1 Richmond Road, Exeter.
11	Bratton Fleming—School	Education Committee	Price, London House, Church Street, Bargoed.
11	Birkby—Additions	—	Lunn & Kaye, Architects, 14 John William Street, Huddersfield.
12	Isleworth—Additions to Workhouse	Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
12	Esksdalmuir—Observatory Superstructure	H.M. Works Department	H.M. Office of Works, 3 Parliament Square, Edinburgh.
12	Hathern—Cottages	Co-operative Society	S. Smith, Tanners Lane, Hathern.
12	Chelmsford—Classrooms	Governors	C. & W. H. Pertwee, Bank Chambers, Chelmsford.
14	Messingham—School	Education Committee	Scorer & Gamble, Architects, Bank Street Chambers, Lincoln.
15	Rhymney—Houses	Victoria Building Club	J. Llewellyn, Smith & Davies, Architects, Aberdare.
15	Norton's Cross—Additions to Schools	Managers	A. Swash, Architect, Midland Bank Chambers, Newport.
15	Canterbury—Alterations at Asylum	Asylum Committee	W. J. Jennings, Architect, 4 St. Margaret's Street, Canterbury.
16	Redruth—Villa	J. Simmons	H. W. Collins, Architect, Clinton Road, Redruth.
16	Wallasey—Schools	Urban District Council	J. Holt, Architect, 9 Albert Square, Manchester.
16	St. Dogmael's—Additions to School	Education Committee	D. E. Thomas, Architect, 17 Victoria Place, Haverfordwest.
16	Llunabad—Temperance Hall	Committee	D. Conroy, Architect, 21 Shipquay Street, Londonderry.
18	Stockport—Union Offices	Guardians	C. F. Johnson, Clerk, Union Offices, Stockport.
18	Worthing—School	Education Committee	Borough Education Department, Worthing.
19	Sheffield—Alteration to County Court	—	H.M. Office of Works, Storey's Gate, London, S.W.
19	Birmingham—School	Education Committee	J. A. Palmer, Secretary, Education Dept., Edmund St., Birmingham.
20	Aylesbury—Schools	Education Committee	Clerks of Works Department, Education Office, Aylesbury.
23	Edinburgh—School	School Board	M. Carfrae, Architect, 3 Queen Street, Edinburgh.
23	Wrexham—Library	Town Council	V. Hodge, Architect, 13 Grand Parade, Teddington.
23	Barnstaple—School	Education Committee	G. W. F. Brown, The Square, Barnstaple.
No date	Allymynydd—Sanatorium	—	Architect, 4 Quay Street, Carmarthen.
ENGINEERING:			
Sept. 9	Upton Scudamore—Waterworks	Rural District Council	A. F. Long, Engineer, 53 Market Place, Warminster.
11	Lleata, Italy—Breakwater	Rural District Council	Public Works Department, Rome.
11	Beaminstor—Borehole	Municipality	Beesley, Son & Nicholls, 11 Victoria Street, Westminster, S.W.
11	Bruzio, Italy—Water-supply	North-Eastern Railway Co.	Municipal Offices, Fiumefreddo-Bruzio.
11	Sculcoates—Swing Bridge	Docks Committee	W. J. Cudworth, Engineer, York.
11	Bristol—Pumping Machinery	Urban District Council	W. W. Squire, Cumberland Road, Bristol.
12	Bishop's Stortford—Pumping Engine	Watch Committee	T. Swatheridge, Council Offices, 7 North Street, Bishop's Stortford.
12	Cardiff—Motor Ambulance	Urban District Council	J. L. Wheatley, Town Clerk, Cardiff.
12	Knottingly—Settling Tank, &c.	Town Council	Garside & Pennington, Pontefract.
14	Leeds—Flushing Apparatus	Harbour Board	City Engineer's Office, Leeds.
15	Alicante, Spain—Harbour Works	Education Committee	Harbour Board, Alicante.
18	Portsmouth—Machinery	Directors	A. H. Bone, Cambridge Junction, Portsmouth.
20	Immingham—Dock	Bombay Port Trustees	Sir J. Wolfe Barry & Partner, 21 Delahay Street, Westminster, S.W.
25	Sewtre, Bombay—Pier	Water Board	Sir J. Wolfe Barry, 7 The Sanctuary, Westminster, S.W.
25	Bamford—Filters, &c.	Drainage Board	E. Sandeman, Engineer, Bamford, near Sheffield.
26	Bridgwater—Doors	Municipality	W. J. R. Poole, Clerk, 9 Dampier Street, Bridgwater.
26	Tula, Roumania—Water-supply	—	Municipal Offices, Tula.
Oct. 10	Alexandria, Egypt—Quays	Municipality	Director-General of Harbours and Lighthouses, Alexandria.
23	Mussoorie, India—Electric Lighting and Waterworks Scheme	—	C. H. Shanani, Municipal Office, Mussoorie, India.
Nov. 9	Havana—Pier	—	Cuban, Consulate London.
IRON AND STEEL:			
Sept. 7	Southwell, Notts.—Pipes	Rural District Council	H. Walker & Son, Albion Chambers, King Street, Nottingham.
11	Nottingham—Fencing	Public Parks Department	City Architect, Guildhall, Nottingham.
13	Limerick—Dust Pails	Public Health Committee	Surveyor's Office, Town Hall, Limerick.
16	Island of Barra—Pipes, &c.	Municipal Board	J. Wedderspoon, Engineer, The Castle, Inverness.
Oct. 9	Mussoorie, India—Pipes, &c.	—	C. H. Shanani, Municipal Office, Mussoorie.
PAINTING AND PLUMBING:			
Sept. 9	Ashton-under-Lyne—Painting Refreshment Rooms	Committee	J. Neal, Town Hall, Ashton-under-Lyne.
11	Malton and Thirsk—Painting	North-Eastern Railway Co.	H. J. Rudgard, Engineer, North-Eastern Station, York.
12	Manchester—Painting Houses	Committee	City Architect, Town Hall, Manchester.
12	Isleworth—Painting Workhouse	Guardians	Union Offices, Isleworth, W.
13	Kirkby-in-Furness—Recolouring Church	Guardians	J. Coulton, Sandside, Kirkby-in-Furness.
14	Uxbridge—Painting Workhouse	Guardians	W. L. Eves, Surveyor, 54 High Street, Uxbridge.
14	Fulham—Redecorating Children's Homes	Guardians	E. J. Mott, Clerk, Guardians' Offices, Fulham Palace Road, W.
15	Canterbury—Painting Asylum	Asylum Committee	W. J. Jennings, Architect, 4 St. Margaret's Street, Canterbury.
18	Canterbury—Painting at Electricity Works	Electric Light Committee	A. L. Turley, City Surveyor, Canterbury.
ROADS AND CARTAGE:			
Sept. 7	Swansea—Road Works	Rural District Council	T. Trevor Williams, Surveyor, Alexandra Road, Swansea.
7	Ramsbottom—Materials	Urban District Council	T. H. Bell, Surveyor, Ramsbottom.
8	West Didsbury—Making-up	Corporation	Surveyor, Town Hall, West Didsbury.
11	Harrow-on-the-Hill—Making-up	Trustees	Cowell & Shaw, Surveyors, 49 Finsbury Pavement, E.C.
12	Ovingdean—Road Construction	—	E. Millard, Surveyor, 1 Finsbury Circus, London, E.C.
12	Crewe—Street-making	Town Council	G. Eaton-Shore, Borough Surveyor, Crewe.
12	Crewe—Repaving	Town Council	G. Eaton-Shore, Borough Surveyor, Crewe.
12	Horsham—Road Materials	Urban District Council	S. Mitchell, Clerk, Council Offices, Horsham.
13	Kingston-upon-Thames—Road Works	Corporation	Borough Surveyor, Kingston-upon-Thames.
15	Elham—Asphalting Playground	Guardians	E. Lonergan, Clerk, 11 Cheriton Place, Folkestone.
16	Harrow-on-the-Hill—Granite	Urban District Council	J. Percy Bennetts, Surveyor to the Council, Harrow.
16	Devonport—Cartage	Town Council	Surveyor's Offices, Ker Street, Devonport.
18	Stretford—Granite Paving	Urban District Council	Surveyor, Stretford, Council Offices, Old Trafford.
18	Stevenage—Road	Urban District Council	Council Offices, Orchard Road, Stevenage.
18	Camberwell—Making-up	Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, S.E.
25	Bishop's Stortford—Gravel	Urban District Council	Surveyor to the Council, Bishop's Stortford.
25	Bishop's Stortford—Materials	Urban District Council	T. Swatheridge, Clerk, Council Offices, Bishop's Stortford.
Oct. 4	Wanstead—Making-up	Urban District Council	Council Offices, Wanstead, N.E.
SANITARY:			
Sept. 7	Southwell—Sewerage Works	Rural District Council	H. Walker & Son, Albion Chambers, King Street, Nottingham.
9	Gadlys Uchaf—Laying Sewers, &c.	Building Club	T. D. Williams, Secretary, 10 Canon Street, Aberdeen.
11	Alnwick—Relaying Sewer	Rural District Council	H. W. Walton, Clerk to the Council, Alnwick.
11	Gayton and Willaston—Sewers, &c.	Rural District Council	F. E. Priest, 13 Harrington Street, Liverpool.
18	Hollingbourne—Sewerage Works	Guardians	Fairbank & Son, Civil Engineer, Lendal Chambers, York.
21	Camberley—Sewerage and Sewage-disposal Works	Urban District Council	Willcox & Raikes, 63 Temple Row, Birmingham.
23	Dorking—Sewerage Works	Urban District Council	G. R. Strachan, 9 Victoria Street, Westminster, S.W.

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Complete List of Contracts Open.—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
TIMBER:			
Sept. 14	Herne Bay—Timber	Urban District Council	F. W. J. Palmer, Surveyor, Town Hall, Herne Bay.
" 25	London, E.C.—Telegraph Poles	General Post Office	S. C. Hooley, Stores Dept., G.P.O., 17 & 19 Bedford St., London, W.C.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Sept. 23	Cheshunt—Library	—	£1 is.	A. Collingwood Lee, Manor House, Cheshunt.
Oct. 9	London—Shop Fronts	£75	—	W. H. Smith & Sons, 186 Strand, W.C.
" 16	Preston—School	£50, £30 and £20	—	Director of Education, Education Offices, Preston.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

Current Market Prices

FORAGE.			
	£ s. d.	£ s. d.	
Beans	per qr. 1 12 0	1 12 6	
Clover, best	per ton 3 12 0	4 0 0	
Hay, good	do. 3 3 0	3 10 0	
Sainfoin mixture	do. 3 7 0	3 15 0	
Straw	do. 1 10 0	1 18 0	
OILS AND PAINTS.			
Castor Oil, French	per cwt. 1 0 5	—	
Colza Oil, English	do. 1 2 3	—	
Copperas	per ton 2 0 0	—	
Lard Oil	per cwt. 2 15 0	2 17 0	
Lead, white, ground, carbonate	per ton 16 0 0	—	
Do. red	do. 15 0 0	0 19 0	
Linseed Oil, barrels	per cwt. 0 17 4½	—	
Petroleum, American	per gal. 0 0 5½	—	
Do. Russian	do. 0 0 5½	—	
Pitch	per barrel 0 8 0	—	
Shellac, orange	per cwt. 9 2 0	—	
Soda, crystals	per ton 3 2 6	3 5 0	
Tallow, Town	per cwt. 1 5 6	1 5 9	
Tar, Stockholm	per barrel 1 5 0	—	
Turpentine	per cwt. 2 6 0	—	
METALS.			
Copper, sheet, strong	per ton 87 0 0	—	
Iron, Staffs., bar	do. 5 15 0	8 0 0	
Do. Galvanized Corrugated sheet	do. 11 0 0	—	
Lead, pig, Soft Foreign	do. 14 8 9	—	
Do. do. English common brands	do. 14 15 0	—	
Do. sheet English, 3lb. per sq. ft. and upwards	do. 15 0 0	—	
Do. pipe	do. 16 0 0	—	
Nails, cut clasp, 3in. to 6in.	do. 9 5 0	—	
Do. floor brads	do. 9 0 0	—	
Steel, Staffs., Girders and Angles	do. 5 7 6	5 12 6	
Do. Mild bars	do. 6 0 0	6 5 0	
Tin, Foreign	do. 147 10 0	148 0 0	
Do. English ingots	do. 148 0 0	148 10 0	
Zinc, sheets, Silesian	do. 27 15 0	—	
Do. do. Vieille Montaigne	do. 28 7 6	—	
Do. Spelter	do. 26 0 0	26 10 0	
TIMBER.			
Soft Woods.			
Fir, Dantzic and Memel	per load 2 15 0	5 0 0	
Pine, Quebec, Yellow	do. 4 0 0	7 10 0	
Do. Pitch, American	do. 3 0 0	5 0 0	
Laths, log, Dantzic	per cu. fath. 4 0 0	6 0 0	

Deals, Nederkalix, Yellow, 1st, 4x11	per std. 11 0 0	£ s. d.	£ s. d.
Do. do. do. 2nd, 4x11	do. 10 0 0	—	—
Do. do. do. 4x6	do. 8 10 0	—	—
Do. Brahestad, Yellow, Unsorted, 4x9	do. 10 10 0	—	—
Do. do. do. 4x8	do. 9 0 0	—	—
Do. Quebec, Bright Pine, 3rd, 3x11	do. 12 0 0	—	—
Do. Gamleby, White, Unsorted, 3x9	do. 8 15 0	—	—
Do. do. do. 3x7	do. 7 15 0	—	—
Do. Keret, Yellow, 3rd, 3x9	do. 9 15 0	—	—
Do. Stugsund, Yellow, Dry, Mixed, 3x9	do. 16 10 0	—	—
Do. do. do. 2½x7	do. 11 15 0	—	—
Do. Archangel, Yellow, 3rd, 3x8	do. 8 5 0	—	—
Do. Uleaborg, Yellow, Unsorted, 3x7	do. 7 10 0	—	—
Do. Norrköping, Yellow, 1st & 2nd, 3x7	do. 8 15 0	—	—
Do. Halifax, Hemlock, Unsorted, 2½x7	do. 7 0 0	—	—
Do. Koivonsaari, Yellow, Unsorted, 2½x7	do. 8 15 0	9 0 0	—
Do. Waijai, White, 2½x7	do. 7 10 0	—	—
Do. Mem. Yellow, Unsorted, 2½x7	do. 8 10 0	—	—
Battens, all kinds	do. 6 10 0	11 10 0	—
Flooring Boards rin. prepared, 1st...	per square 0 10 3	0 11 0	—
Do. 2nd	do. 0 10 0	—	—
Do. 3rd, &c.	do. 0 7 3	—	—
HARD WOODS.			
Ash, Quebec	per load 3 17 6	7 5 0	0
Birch, New Brunswick	do. 2 5 0	4 17 6	0
Do. Quebec do.	do. 2 10 0	5 0 0	0
Box, Turkey	per ton 7 0 0	20 0 0	0
Cedar, Cuba	per ft. sup. 0 0 3½	0 0 4	0
Do. Honduras	do. 0 0 3½	0 0 4	0
Do. Tobasco	do. 0 0 5	—	—
Whitewood, American, logs	per ft. cu. 0 1 3	0 1 6	0
Do. do. planks and boards	do. 0 1 3	0 3 0	0
Elm, Quebec	per load 4 0 0	8 10 0	0
Jarrath, plank	per ft. cu. 0 2 6	0 3 0	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup. 0 0 4½	0 0 6	0
Do. Tobasco	do. 0 0 4	0 0 6	0
Do. Cuba	do. 0 0 4½	0 0 6	0
Do. African	do. 0 0 3½	0 0 4½	0
Oak, Wainscot	per log. 3 0 0	6 15 0	0
Teak, Indian, logs	per load 10 0 0	19 0 0	0
Do. do. planks	do. 13 0 0	20 10 0	0

Coming Events.

Wednesday, September 6.	INSTITUTE OF SANITARY ENGINEERS.—Election Committee at 3 p.m.; Organizing Committee at 5 p.m.
	EDINBURGH ARCHITECTURAL ASSOCIATION.—Opening of Exhibition of Drawings and Photographs of Architectural Refinements, National Portrait Gallery, at 4 p.m.
Saturday, September 9.	INSTITUTE OF SANITARY ENGINEERS.—Visit to Garden City at Leichworth. Train leaves King's Cross at 12.40 p.m.
Friday, September 15.	ARCHITECTURAL ASSOCIATION.—Week-end Excursion to Cambridge.
Saturday, September 16.	NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to New Royal Infirmary, Newcastle-on-Tyne.
Monday, September 25.	ARCHITECTURAL ASSOCIATION.—Day School commences at 9.45 a.m. (and Evening School at 6.30 p.m.)
Saturday, September 30.	NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.
Wednesday, October 4.	KING'S COLLEGE, LONDON.—Course of Training for Sanitary Inspectors in Building Construction commences.
Friday, October 6.	ARCHITECTURAL ASSOCIATION.—Annual General Meeting, President's Address and Distribution of Prizes, 7.30 p.m.
New Companies.	
ROBERTS & SONS, LTD., plumbers and decorators, &c. Capital: £2,000.	
D. FANSHAW & Co., LTD., stone and brick merchants, &c., Salford, Lancashire. Capital: £10,000.	
BRITISH METALLIC ROOFING AND CONSTRUCTION CO., LTD., Croft Road, Eaglescliffe, county Durham. Capital: £3,000.	
R.I.B.A. Visit to Newcastle.—The annual dinner of the Institute will be held at Newcastle-on-Tyne on October 13th. Local visits are being arranged in connection with it.	

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MACHINIST.—Band and circular sawyer, sharpens saws, planing machines, fourcutter; some experience in French spindle; could take charge of small plant; town, country, or would go abroad.—MACHINIST, 51, Somers Road, Walthamstow. 1344

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SURVEYOR'S JUNIOR ASSISTANT, 22, requires post in Borough Surveyor's office; holding public appointment, has served 3 years articles with Borough Surveyor. Country town preferred.—E. BURMAN, Ramsbury, Wilts. 1349

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On THURSDAY at 6.45, beginning OCTOBER 5th.

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On WEDNESDAYS at 6.30, beginning OCTOBER 4th, and on FRIDAYS at 6.30, beginning OCTOBER 6th. For particulars of both Day and Evening Classes apply to the undersigned.

W. W. SETON,
 Secretary.

Educational—cont.

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FOUNDED 1884. INCORPORATED 1893.

Telegram: "Crypt, London." Telephone: 1852, Holborn.

An EXAMINATION to qualify for MEMBERSHIP will be held on October 3rd, 4th, and 5th, 1905, in LONDON and elsewhere.

SYLLABUS on application to the SECRETARY, at Staple Inn Buildings, Holborn, W.C.

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COURSE of TRAINING for SANITARY INSPECTORS in BUILDING CONSTRUCTION, Chemistry and Physics of Hygiene and General Duties of Sanitary Inspectors, will commence OCTOBER 4th. Apply SECRETARY, King's College, London.

THE ARCHITECTURAL ASSOCIATION.

A week-end excursion is being arranged to Cambridge. The party will leave London on Friday evening, September 15th, returning early on the following Monday morning. The various Colleges and other buildings of interest will be visited under the guidance of Mr. W. M. Fawcett. Full information will be forwarded on application to the Secretary, 18, Tufton Street, Westminster.

COURSES OF INSTRUCTION IN ARCHITECTURE.

The Day School will open on Monday, September 25th, at 9.45 a.m. Intending Pupils are requested to forward their names to the Secretary as soon as possible.

The Evening School also opens on the same date at 6.30 p.m. A pamphlet containing full information as to the classes and advantages of membership may be obtained on application to the Secretary.

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THE INSTITUTE OF SANITARY ENGINEERS, Ltd.

PRACTICAL SANITARY SCIENCE. EXAMINATIONS IN PRACTICAL SANITARY SCIENCE, and qualifying for admission to the Institute, and Students' Examinations will be held in London, Birmingham, and Sheffield, on November 24th and 25th, 1905.

Further particulars as to Membership Examinations, Students' Classes, Lectures, &c. can be obtained from the undersigned. ARTHUR E. ASHBY,

Secretary I.S.E.

19, Bloomsbury Square, London, W.C.

EMPLOYMENT REGISTER.

Too late for Classification.

- 1331.—BRICKLAYER wants work, sanitary, fire and general work; can take charge.
- 1332.—ARCHITECT'S ASSISTANT; working drawings, specifications, details, surveying and levelling. Salary £2.
- 1341.—ARCHITECT'S JUNIOR ASSISTANT (21); 4 years' exp.; advanced building constr. certifi. mod. s.
- 1342.—ARCHITECT'S JUNIOR ASSISTANT (23); 5 years' exp.; good refs.; mod. s.; London office preferred.
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- 1344.—MACHINIST, BAND and CIRCULAR SAWYER; sharpens saws, planing machines, fourcutter. Take charge; town, country or abroad.
- 1346.—STUDENT, R.I.B.A.; mod. sal.; 5 years' good exp.; wkg. drawings, perspectives, competition drawings, surveying and levelling.
- 1348.—BUILDER'S CLERK; exp. D.E. bookkeeping, time sheets, plans, &c.; town or country.
- 1349.—SURVEYOR'S JUNIOR ASSISTANT (22); 3 years' with boro' surveyor. Holds public appt. country boro' surveyor's office preferred.
- 1350.—BRICKWORK and POINTING wanted; 1st class work; mod. terms. Can take charge, or wkg. foreman; good refs.; abstainer. Town or country.
- 1351.—PHOTO PRINTS, tracings, perspectives prepared. Mod. terms. Samples sent.
- 1352.—BUILDER'S CLERK; book-keeping, quantity surveying, abstracts, time sheets, typewriter, &c.; refs.
- 1353.—YOUNG ARCHITECT just starting can assist other architects.
- 1354.—JUNIOR DRAUGHTSMAN (21); wkg. drawings, details, tracings, colourist; 5 yrs. exp.; mod. s.
- 1355.—SHOP FOREMAN OF JOINERS; setter out; manager; used to 1st class work; London or provinces.

See p. xx for the Employment Register.

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Designs and Plans must be sent to me at the Town Hall, not later than 10 a.m., on MONDAY, the 16th of OCTOBER, 1905.

By order. HENRY HAMER,
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 CONTRACT, No. 5.

TENDERS are hereby invited for the CONSTRUCTION of an ENGINE and BOILER HOUSE, FOUNDATIONS for ENGINE and PUMPING MACHINERY, CHIMNEY SHAFT, COAL STORE, WORKSHOP, &c., in connection with the above works.

Copies of the bills and quantities will be supplied on application to the Engineers, Mr. PERCY GRIFFITH, M.Inst.C.E., F.G.S., of 54, Parliament Street, Westminster, S.W., and Mr. BRUCE MCGREGOR GRAY, A.M.Inst.C.E., Council Offices, Selby, Yorkshire, on payment of £5, which will be returned to all Contractors who shall submit a bona-fide Tender for the work on or before the 15th day of SEPTEMBER, 1905.

Plans and specifications can be inspected, and any further information in regard to the works obtained, at the Offices of the ENGINEERS above mentioned.

Tenders must be made on the form provided for the purpose, and delivered under seal to the undersigned by the date above named.

The Council do not bind themselves to accept the lowest or any Tender.

By order of the Council,
 J. H. BANTOFT,
 Clerk to the Urban District Council.

Council Offices, Selby,
 Dated the 23rd day of August, 1905.

ELHAM UNION.

ASPHALTING PLAYGROUND, &c.

The Guardians invite TENDERS for properly REPAIRING the YARDS, PLAYGROUNDS, PATHS, &c., at the Cottage Homes, Cheriton, with reliable asphalt or other hard and durable material.

Persons tendering to specify how it is proposed to do the work, giving detailed quantities, with quality and description of the material proposed to be used, including any edging, kerbing, channelling, and levelling, &c., that may be necessary, the price to include all labour and materials, and the work to be completed to the satisfaction of the Guardians' Building Committee.

Tenders to be delivered at my office, as under, before the 15th SEPTEMBER.

R. LONERGAN,
 Clerk.
 11, Cheriton Place,
 Folkestone,
 18th August, 1905.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.

OFFICE: 6, GREAT NEW STREET, FETTER LANE E.C.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending September 1st twenty-two failures in the building and timber trades in England and Wales were gazetted.

G. BUXTON, builder, Wimbledon. Adj. Aug. 25th.

A. E. CLOUTMAN, builders' merchant, Bristol. P.E., Bristol Guildhall, Sept. 29th, at 12.

P. R. HOGGEN, builder, Lyminge. P.E., Canterbury Guildhall, September 21st, at 10.

W. BARLEY, architect and building contractor, Manchester. P.E., Salford C.C., Sept. 18th, at 11.

D. BLOOM & SONS, builders, Liverpool. P.E., Liverpool C.C., Sept. 7th, at 11.

TANNER BROTHERS, builders and contractors, Raunds. P.E., Northampton County Hall, Oct. 24th, at 12.

T. STREET, builder, Petworth. P.E., Brighton C.C., Oct. 5th, at 11.

RAVEN SLATE AND MANTEL CO., Birmingham. R.O. Aug. 25th.

E. P. W. COLLETT, carpenter, Worcester. P.E., Worcester Guildhall, Sept. 12th, at 2.

D. THOMAS & SON, builders and contractors, Cardiff. R.O. Aug. 22nd.

J. A. JAMES, builder and contractor, Llanasa. R.O. Aug. 21st. Adj. Aug. 24th.

STORER BROTHERS, builders, Leicester. Liabilities £7,257; assets £1,763.

E. J. TAYLOR, builder, Sydenham. First meeting, 24, Railway Approach, London Bridge, S.E., Sept. 7th, at 11.30. P.E., Croydon C.C., Nov. 8th, at 11.

G. B. TIPPING, painter and decorator, Malvern. First meeting, 45, Copenhagen Street, Worcester. P.E., Worcester Guildhall, Sept. 26th, at 2.

D. E. ELLIS, painter and decorator, Bangor. First meeting, Magistrates' Room, Bangor, Sept. 7th, at 12.15. P.E., same, Sept. 7th, at 12.30.

CHARLES GIMSON, builder, 33, Lawrence Lane, E.C. Unsecured debts £3,880; fully-secured liabilities £26,282; assets £13,842.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Ashford.—For the erection of a new sorting-office at Ashford, for H.M. Office of Works, &c.:

Ellis Brothers...	£3,056	0	0
Johnson & Co.	2,943	0	0
C. J. Epps	2,800	0	0
F. & G. Foster	2,692	0	0
E. J. Bowles	2,671	12	0
C. Howland	2,670	0	0
W. Baker & Co.	2,640	0	0
J. Shelbourne & Co.	2,638	0	0
T. T. Denne	2,587	0	0
Hayward & Paramor	2,567	0	0
W. H. Grigg	2,554	0	0
W. H. Hyde	2,538	0	0
G. Browning	2,516	0	0
G. Barton,* New Street, Ashford, Kent	2,498	0	0

* Accepted.

Bingley (Yorks).—For the erection of a new boys' school, for the Bingley Grammar School Trust. Mr. W. R. Nunns, architect, Bingley:—

Mason.

H. Barraclough	£1,900	0	0
J. Moulson & Son	1,840	0	0
W. North & Sons	1,760	0	0
T. E. Sugden	1,740	0	0
W. Foulds & Sons	1,719	0	0
Waddington Brothers	1,689	18	0
R. Wood	1,618	15	4
J. & W. Potter	1,617	10	0
T. Moore	1,584	0	0
D. Wildman*	1,580	5	0
J. Brown & Son	1,556	10	0
I. Rushworth	1,550	0	0

Joiner.

W. Mason & Son	945	0	0
W. R. & R. Atkinson	845	0	0
T. E. Sugden	840	0	0
T. Foulds	830	0	0
S. Town	815	0	0
Wood & Thornton	812	1	8
J. Wilkinson	790	0	0
R. Greenwood	744	0	0
I. Taylor	742	0	0
A. Kilbank	738	0	0
J. Hartley	735	10	0
S. Foster	700	0	0
W. Whitley*	695	0	0

Slater.

J. Walsh & Sons	111	15	0
F. Shaw	110	0	0
T. Thornton	106	0	0
G. W. Sedgwick	100	12	6
Hill & Nelson	98	15	0
W. Thornton*	96	0	0

Plumber.

H. Braithwaite & Co.	239	0	0
T. Bage	236	12	0

W. Wallace	£235	0	0
P. Asley	234	0	0
T. Lambert & Son	232	0	0
T. E. Sugden	220	0	0
H. Walker & Son	220	0	0
A. Bolton	218	7	6
T. Hill & Sons	214	0	0
S. Rushworth*	203	0	0

Plasterer.

T. Cordingley & Sons	370	0	0
S. Pickles	339	2	0
F. Shaw	300	0	0
H. Spurr & Sons	255	10	0
W. Hargreaves	255	0	0
J. W. & G. Sugden	240	0	0
W. H. Charnock	223	9	0
E. Whitley*	214	12	11

Painter.

F. Sutcliffe	98	15	0
W. Walker & Sons	97	10	0
E. Harland & Sons	95	0	0
J. Wilkinson	89	17	0
T. R. Hewitt	88	11	0
F. Langstaff	85	0	0
J. A. Mullen	82	2	2
W. Stoney	80	0	0
E. Thompson	79	17	0
J. Earnshaw	77	19	0
A. Anderson	74	10	0

Heating apparatus.

J. Walker & Co.	240	10	0
R. Dawson & Co.	190	0	0
Dilworth & Carr	185	17	0
Braithwaite & Co.	181	10	0
Hope & Co.	175	10	0
Haworth & Co.	175	0	0
S. Rushworth	175	0	0
J. King & Co.	175	0	0
E. J. Clough	161	9	6
W. J. Fox	159	10	0
Clapham Brothers*	156	0	0
A. Bolton	155	0	0
J. Cook & Son	122	0	0

* Accepted.

Devizes.—For the erection of a secondary school at Devizes, Wilts, for the Education Committee. Mr. R. E. Brinkworth, F.S.I., architect, 16, Old Bond Street, Bath. Quantities by the architect:—

W. Webb, Bath	£7,462	0	0
Downing & Rudman, Chippenham	7,277	0	0
Spackman & Sons, Swindon	6,694	0	0
Hayward & Wooster, Bath	6,597	0	0
Wills & Sons, Bath	6,490	0	0
Chancellor & Sons, Bath	6,480	0	0
T. J. Blackmore, Bath	6,450	14	6
W. E. Chivers, Devizes	6,280	10	0
H. Ash, Devizes	6,263	0	0
A. W. Long, Bradford-on-Avon	6,111	0	0
A. J. Colborne, Swindon	6,073	4	0
J. Long & Sons,* Bath	5,982	0	0

* Recommended for acceptance.

Duffryn Rhondda.—For the erection of seventy-eight houses, including two business premises, at Duffryn Rhondda, Cymmer, P.T., for the Nant-y-bar Building Society. Messrs. W. B. Jones & Peregrine, architects and surveyors, Bank Chambers, Port Talbot:—

D. Edwards, Resolven	£20,065	10	0
J. Davey	19,619	1	6
J. Davies	19,470	0	0
B. Cockwell	16,535	0	0
M. Cox	15,294	0	0
M. Jenkins	14,426	10	0
J. Nicholas*	13,190	13	0

* Accepted. [Rest of Port Talbot.]

Haslemere (Surrey).—For the erection of a house for Mr. M. Dawson, on Beech Road. Mr. John H. Howard, architect and surveyor, Haslemere:—

J. Eele	£1,341	0	0
D. Fry, Godalming	1,250	0	0
Chapman & Lowry	1,237	19	0
W. Rollason, Hindhead	1,220	0	0
The Haslemere Builders, Ltd.	1,162	0	0
R. Smith*	1,105	15	0

* Provisionally accepted. [Rest of Haslemere.]

Haslemere (Surrey).—For the construction of a new road at Camels Dale, for the Sussex County Council. Mr. John H. Howard, architect and surveyor, Haslemere:—

Chapman & Lowry	£445	10	0
The Haslemere Builders, Ltd.	347	0	0
G. A. Franks,* Guildford	352	0	0

* Recommended for acceptance.

[Rest of Haslemere.]

Hull.—For the erection of "Sun" Fire Office, Lowgate, Hull. Mr. B. S. Jacobs, architect, Lincoln's Inn Buildings, Bowdley Lane, Hull:—

Quibell, Son & Greenwood	£5,285	17	8
Hockney & Liggins	5,199	0	0
Bowman & Sons	5,182	0	0
Morrell & Sons	5,146	7	0
W. Sanderson	5,129	0	0
F. Beilby	5,119	0	0
F. Southern	5,050	0	0
E. Good & Son	5,034	0	0
F. Singleton	5,003	0	0
M. Harper	4,994	19	0
G. Houlton	4,976	0	0
Hebblewhite & Wilson	4,970	0	0
T. Goates	4,969	0	0
C. Longden & Sons,* Sheffield	4,960	0	0

* Accepted. [Rest of Hull.]

Middlewich.—For the erection of new school buildings in King Edward Street, Middlewich, for the Administrative Sub-Committee for the Winsford and Middlewich District. Mr. J. Cawley, architect, Bull Ring, Northwich:—

Pickstock & Royle, Crewe	£11,750	0	0
F. Mathews, Nantwich	11,406	0	0
Birchall Brothers, Middlewich	9,855	12	0
H. Fairclough,* Warrington	9,410	0	0

* Accepted.

(Continued on p. xviii.)

ROOFING SLATES:
Velinheli, Penrhyn, and Westmoreland.
SLATE SLAB GOODS:
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

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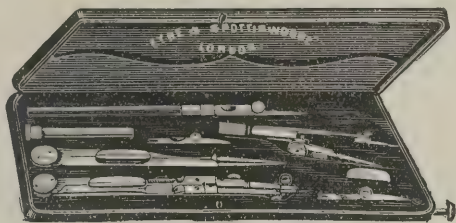
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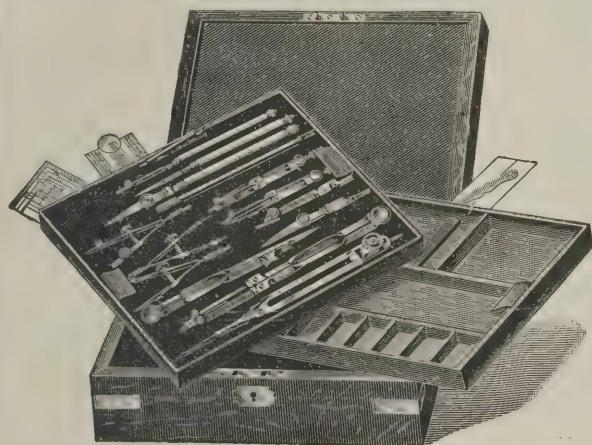
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LIST No. 5 of DRAWING OFFICE REQUISITES, &c.



No. 205. Price 9/-

Leather Pocket Case, with rod fastening, containing 5-in. cylindrical-legged electrum compass, needle-pointed, with pen and pencil points, divider, ruling pen, spring bow with changeable leg, case of leads, and compass key. The same case without the spring-bow set, 6/-



No. 52. Price £6 10s.

THE PRESENTATION CABINET CASE.

Size: 8 x 6½ x 2½ in.

Handsome brass capped and cornered case, with two trays, and containing the following highly-finished instruments in German silver, viz., compass, with two knee-joints and needle points, pen and pencil points, bar, needle-pointed hair spring divider, three needle-pointed spring bows, ink and pencil hollow bows with double knee-joints, needle tracing point on ivory handle, jointed and steel pens, fully divided proportional compass, ivory parallel, sector, protractor and fork-shaped compass key.

5-in. HAIR-SPRING DIVIDER.

Improved Pattern.



Second quality 5/- each.
First quality 6/- "

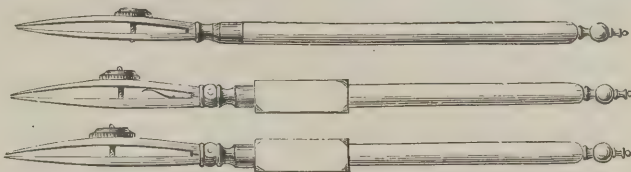
NAPIER COMPASSES.



Napier Pocket Compasses, needle-pointed, electrum, 12/6.

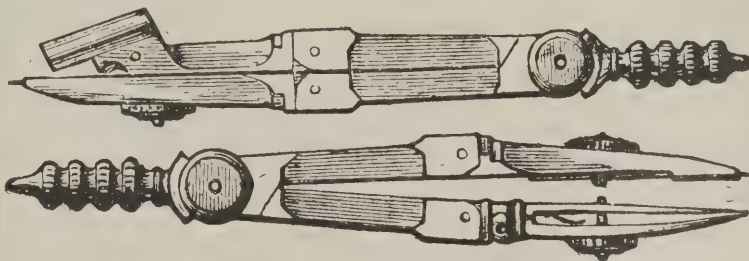
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BEST ENGLISH-MADE HAND RULING PENS.



Good quality fine-line ruling pen, ivory handle, whole steel	2/- each.
Do. do. do. superior finish	2/8 "
Do. do. do. with square handle	3/3 "
Superior quality 6-in. jointed ruling pen, electrum	4/- "
Best finished 6-in. square-handled jointed ruling pen, electrum	5/- "
Best finished electrum, with improved steel upper nib, 6-in. jointed square-handled ruling pen	7/- "

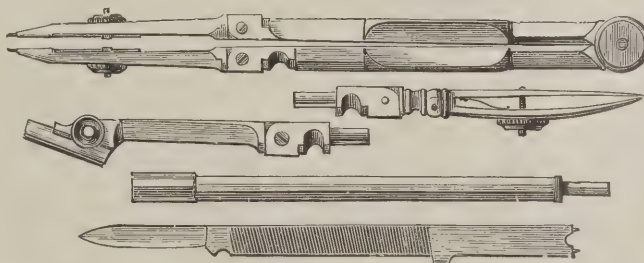
HOLLOW BOWS WITH NUT AND BOLT ADJUSTMENT.



Best London Made.

Second quality 10/- per pair.
Extra quality 15/- "

BEST QUALITY NUT AND BOLT HALF SET.



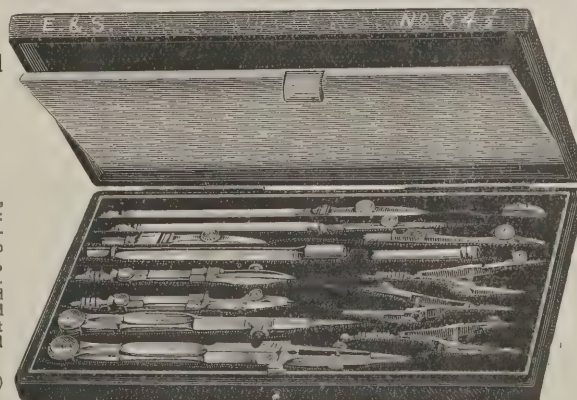
Half Set, complete in neat cardboard case 25/- each.

Cases for Young Engineers, with Nut and Bolt Compasses with Spring Bows.

Prices from 30/- to 42/6

Special neat leather snap case, silk lined, with lift-up flap inside lid. Contents: 6-in. nut and bolt, German silver compass with needle points, steel-jointed, two knee-joints, deep hollow, lengthening bar, hinged pen point and pencil point, 5-in. round pointed divider to match, hinged ruling pen with pricker, 3 improved spring bows, with needle points and nut and bolt adjustment, case of leads and key.

(The price of the box illustrated is 42/6)



The instruments, &c., that are sent out by The Builders' Journal Supply Department are of the highest quality, but should they in any case not meet the requirements of our correspondents we are at all times willing to return remittances and take back the articles.

We shall be pleased to arrange Special Terms for Schools, Technical Institutions, &c.

THE BUILDERS' JOURNAL SUPPLY DEPARTMENT,

6, Great New Street, Fetter Lane, E.C.

TENDERS—cont. from p. xvi.

London, S.E.—For the conversion of the front block of the Norwood old school premises into a home for the aged poor, for the Lambeth Board of Guardians :—

E. Mills, 21A, Blackheath, S.E.	£6,901
C. Blyton & Sons, London, S.E.	6,860
C. Ansell, Chicheley Street, London, S.W. ...	6,800
Spreckley & Co., London, W.C.	6,448
J. T. Messom & Sons, Twickenham	6,390
C. Wales, Hackney	6,293
J. Bowyer & Co., Upper Norwood, S.E. ...	6,145
S. Pocock, London, S.W.	6,123
H. Bragg & Sons, Brixton	6,000
F. Bryen, London, N.	5,993
J. Barker & Co., Kensington, W.	5,923
J. G. Baker & Son, Barnsbury, N.	5,920
Marrison & Harvey, Paddington, W.	5,900
Martin, Wells & Co., Vauxhall, S.E.	5,850
W. Smith & Son, London, S.E.	5,774
Patman & Fotheringham, London, W.C. ...	5,703
G. Godson & Sons, London, W.	5,693
H. Groves, Stockwell Street, Greenwich ...	5,655
H. Kent, Lewisham	5,413
C. Dearing & Son, London, N.	5,393
L. F. Lamplough, London, W.	5,389
B. E. Nightingale, Albert Embankment ...	5,364
Marriott & Salter, Caterham Valley, Surrey	5,160
G. Wales & Co., Walthamstow	5,030
W. Lawrence & Son, Waltham Cross	4,984
J. Parsons, London, S.E.	4,775
E. Wall, Tooting, S.W.	4,635
S. E. Moss & Co.,* Bournemouth Park Road, Southend-on-Sea	4,500

* Accepted.

London, S.W.—For alterations and additions to I. Stanley & Co.'s premises, Lavender Hill, S.W. Mr. W. C. Poole, architect, 62, Belleville Road, Wandsworth Common, S.W. Quantities supplied :—

Hudson Brothers	£1,270
Lathey Brothers	1,209
Johnson & Co.	1,205
Heather	1,172
Chinchin & Co.	1,169
Turtle & Appleton	1,167
Dearing & Son	1,150
Wills	1,120
Spencer, Santo & Co.	1,100
Triggs	1,100
Tucker,* Lavender Hill, S.W.	1,089

* Accepted.

Nuneaton.—For rebuilding the chancel of St. Mary's Abbey Church, Nuneaton. Mr. Harold Brakspear, F.S.A., architect, High Street, Corsham, Wilts :—

Dallow & Sons, Birmingham	£5,950
Hayward & Wooster, Bath	4,639
J. Hatherley, Bristol	4,473
King & Ridley, Lutterworth	4,197
Gowing & Ingram, Birmingham	4,138
Bowman & Sons, Stamford	3,910
G. F. Smith & Sons, Leamington	3,900
T. Smith, Nuneaton	3,740
Collins & Godfrey, Tewkesbury	3,682
H. Smith Kidderminster	3,589
Willcock & Co.,* Wolverhampton	3,395

* Provisionally accepted.

CAPE TOWN'S MUNICIPAL BUILDINGS.

THE new municipal buildings at Cape Town, opened a few weeks ago, have been erected from the designs of Messrs. H. A. Reid & F. G. Green, A.R.I.B.A., of Cape Town and Johannesburg. The builders were Messrs. T. Howard & F. G. Scott, of Cape Town; Mr. T. L. Wood acting as clerk of the works on behalf of the Council. The buildings are in the Italian Renaissance style, with grace.

GROBAK GREEN SLATE QUARRIES.

The attention of Architects is called to these beautiful Green Slates, which are now available for the British Market.

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ful Classical façades and a handsome campanile tower, 200ft. high, above the centre of the block. The exterior is of Monk's Park Bath-stone, with massive granite base. The external doors and window frames, and also the doors of the city and minor halls, are of teak. The roofs are covered with slate. The building has frontages to four streets and measures 294ft. by 173ft. The façade towards Darling Street has a central feature surmounted by a pediment rising 82ft. above pavement level, the wings on either side being about 60ft. high, surmounted by pedimented dormers and a high-pitched

roof. The structure is divided longitudinally, the municipal portion occupying the Darling Street frontage, and the part of the buildings more especially designed for public purposes fronting to Corporation Street and Longmarket Street, with the principal entrances from Corporation Street. The most striking feature is the grand or city hall, measuring 130ft. in length by 61ft. in breadth, and having a height of 55ft. An organ has been erected by Messrs. Norman & Beard, of London and Norwich, from specifications drawn up by Sir George Martin, organist of St. Paul's Cathedral.

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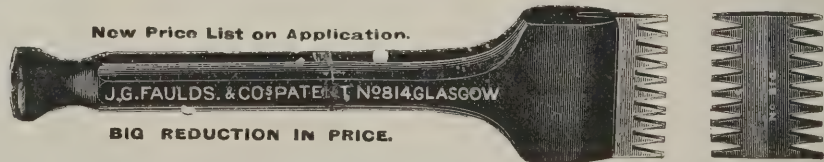
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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

September 13, 1905. Vol. 22, No. 553.

6, Great New Street, Fetter Lane, E.C.

Summary.

A number of representative girder and stanchion connections at the new Ritz Hotel in Piccadilly are illustrated in this issue by special photographs; particular attention is directed to those where the girder is eccentric to the centre line of the stanchion. The partitions throughout the hotel are built of American hollow terra-cotta blocks 12ins. square and mostly 3ins. thick. The setting-out was done by the superintendent, the lines being marked with a trowel upon a coat of rough plaster on the concrete floors. (Page 146.)

The Goodyear exhibition of architectural refinements in mediæval buildings was opened last week at Edinburgh. The builders of the Middle Ages frequently studied effects intended to make their buildings more imposing and interesting to the eye, such as an illusive perspective in the apparent distance of the choir of a church, or the avoidance of a contracted appearance in the upper part of the interior by inclining the walls outwards. (Page 155.)

A party of about eighty visitors from Leeds, Bradford and the West Riding, including corporation officials and representative workmen, travelled to Letchworth recently in order to see the Cheap Cottages Exhibition. They do not seem to have been very much impressed with the exhibits from a practical point of view. (Page 151.)

New working rules have been accepted by the Operative Society of Stonemasons, and there is now no danger of a disturbance in the London building trade. (Page 151.)

An excellent book on hot-water heating, by Mr. Dye, has been published, price 8s. 6d. (Page 150.)

For the first time in this country reinforced concrete pipes are being employed for high-pressure water main at Swarsea. The pipes are constructed on the "Bonna" system and have a skeleton of sheet steel wound around inside and out with cross-shaped bars. Joints are formed with bitumen, covered over with concrete rings. The work is being executed by the Columbian Fireproofing Co., Ltd. (Page 158.)

The London timber market was steady during August, but prices for soft woods are unsatisfactory both to shippers and importers. It is hoped that the conclusion of the war in the East will develop better business during the concluding quarter of the year, and concomitantly will appreciably benefit the timber trade. Teak is scarce, and advices from India show that the output of the new season's trees from the forests will be so small that next year's shipments of European quality will be very inadequate to the demand. (Page 157.)

The Academy Thousands.

DESPITE all the criticism on the futility of an exhibition which is maintained on such one-sided and stereotyped lines, the Academy still draws its thousands of pictures, and the returns for the last exhibition show that, despite the new rule which now reduces the number of works which may be submitted by outsiders from eight to three, there are very much the same high totals as before. Altogether there were more than 11,000 works submitted by non-members, and of these only 82 were accepted outright, while more than 8,000 were rejected at once. Fifteen were condemned as inadmissible for various reasons, and the remainder, numbering 2,692, were chalked with the familiar "D." Of these doubtfuls 1,563 found places in the exhibition, together with the 82 accepted works and 187 by Academicians and Associates. Both in 1901 and 1902 there were more than 14,000 works submitted by non-members; in 1903, 13,653; in 1904, 11,162; and this year 11,153; so that the new rule has by no means materially reduced the labours of the selection committee. Sir Aston Webb was responsible for the arrangement of the architectural works this year. As to the number of the latter submitted we have no figures, but we may make a guess. There were 237 exhibits in the architectural room, and as altogether the exhibition included 1,832 works, the architectural exhibits were practically one-eighth of the total. Taking the number of works submitted by non-members at 11,000 and those accepted at 1,645, this means that one out of every seven was accepted. Of course we have no means of judging in what ratio this might have held good in regard to works of painting, sculpture and architecture, but we may hazard that about 1,600 architectural works were submitted—which is a pretty fair proportion, though we cannot say that the room was any more successful this year than it has been hitherto. The fact cannot be too often reiterated that so far as architecture is concerned the Academy regulation restricting the exhibits to drawings is a hopelessly mistaken one, because architecture is pre-eminently concerned with executed work and nothing is so satisfactory as photography for representing this. We have already pointed out that photographs are admitted in the Scottish art exhibitions, and there is every reason why they should be seen on the walls of Burlington House. The plea for their admission to the Academy has been made over and over again, but it is only by continually hammering at a time-ridden institution that one can hope for any glimpse of reform. The Chantrey enquiry shook up the Academy a

good deal, and maybe it is now in a little better frame of mind to consider possible alterations of some of its methods.

Building Law Cases.

It is one of the ambitions of the native in India to be concerned in a law suit, and if he can carry the matter to the very highest tribunal he regards himself, and is so regarded by his friends, as a man of importance and standing. A similar sort of spirit seems also to prevail in this country, judging from the cases which from time to time crop up in the courts. We refer more particularly to actions under the Building Act. The cases are generally very trivial matters in which a law suit might have been avoided if the demands of the authorities had only been met in a proper manner. It is as well to remember that, however much the anomalies of the by-laws may press upon an individual case, if we have any by-laws at all, they must be administered rigorously. But some people seem to take a special delight in running their head against a stone wall—with the inevitable result.

Under Pressure.

THERE was a case of an absent-minded man who, after lighting his pipe in a railway carriage, dropped the matches out of the window, thinking he was putting them back on the mantelpiece; but possibly the contractor in a story which reaches us from Ireland had more method in his forgetfulness. It appears that some house drains had to be tested. The engineer in charge found that the existence of a gulley and a very sharp fall between the manhole and the next opening prevented the water test being applied and, at the contractor's request, the smoke test was adopted instead; but the engineer stipulated it was to be under pressure and measured by a gauge. Everything was accordingly prepared, and in due course the smoke poured out of the soil pipe, but when the gauge was applied and the workman had pumped himself red in the face without any indication of his exertions on the gauge, the engineer became puzzled. The gauge was taken off and found to be in order. Then the workman started again, and "put his back into it," as requested. But still without effect. Then the gauge and length of pipe were disconnected and the engineer plugged the end of the pipe with his hand. Immediately the gauge flew round to 20. This puzzled him still more, but suddenly the contractor, who had been absent-minded enough not to be quite handy for answering questions, cried out: "Begorra, I forgot to plug the soil pipe!"

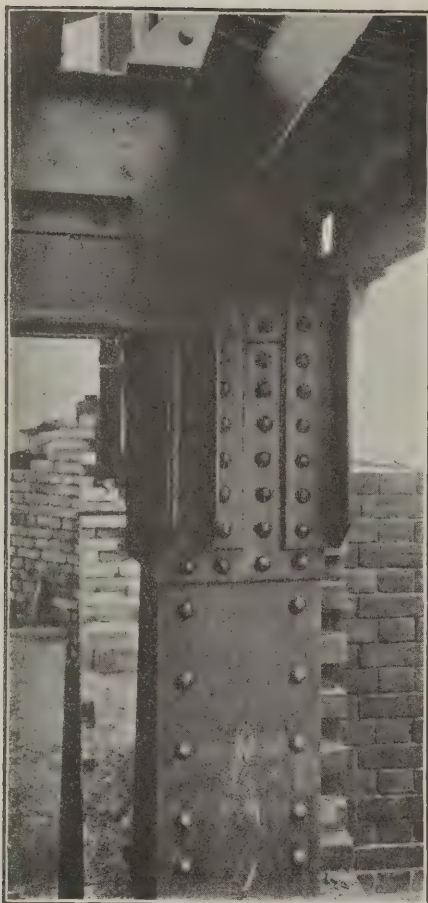


FIG. 1.

THE RITZ HOTEL.

IN this issue we give a further series of photographs and drawings in continuation of our illustration of the erection of the Ritz Hotel, Piccadilly, London. The previous articles of the series appeared in our issues for September 28th, November 2nd and 30th, 1904, and March 1st and 22nd, April 12th and May 24th last. The size and completeness of this building as an example of steel-frame construction typical of the United States, but still somewhat novel to Great Britain, will make it of considerable importance in any future consideration of the progress of building construction in this country, and therefore we are illustrating it somewhat fully. The fact that steel-frame construction has been adopted for several large buildings since the beginning of this job leads to the conclusion that frame-construction is coming rapidly into favour in this country for large commercial premises, and it was with the object of elucidating the foremost practice in a branch of construction which the architectural profession and building trades in future will have to study that we arranged this series of articles.

The building is now rapidly approaching completion. On p. 148 we illustrate the erection of the partitions, which are constructed throughout of terra-cotta blocks, or tiles as they are called in the States. These are 12 ins. square and of three different thicknesses—3 ins., 3½ ins. and 4 ins., the 3 ins. being the size mostly used; they weigh 10 lbs. each. These blocks can be very quickly erected, and are easily cut to fit corners or bends. The illustration shows exactly how the work is executed. At skirting level blocks of a more porous and softer nature are used, so that woodwork can be nailed to them. All the blocks have three air-spaces through them. The partitions are plastered with selenitic plaster and finished with Keene's. The ceiling over the corridors is double, there being a space of 1 ft. between the ceiling

proper and the false ceiling below (formed with "Mack slabs"). Through this enclosed space warm or cooled air will be forced for ventilation and heating purposes.

Hollow terra-cotta is an excellent material for interior walls for steel-framed buildings, on account of its lightness and soundproofness. The partition shown in the photograph is being set to a curved line.

The setting-out of the partitions was done by the superintendent, the lines being marked with a trowel upon a coat of rough plaster on the concrete floors. This plaster quickly set, and the marks were then indelible and not to be obscured by traffic of men and barrows, as chalk would have been, thus facilitating the work and securing accuracy.

These same partition blocks are also used as coverings to protect the steel columns from fire.

We publish below an explanation of the steelwork illustrations, written by the engineer who designed and has been responsible for this portion of the construction.

Notes on the Steelwork. By S. Bylander.

On pp. 152 and 153 is reproduced the third-floor framing plan. At the Arlington Street side the exterior wall is set back and carried on two roin. I-beams with flange plates. Section A-B indicates the method adopted for supporting the set-back wall and sloping roof. On p. 185 of the issue for April 12th last was published a photograph showing the girders near column No. 48. To the right of the plan are shown spandrel sections and a section through the smoke-flue. This latter is made of steel plates riveted together, and forms a circular shaft composed of several sections, lined with firebrick on the inside; it was illustrated on p. 148 of the issue

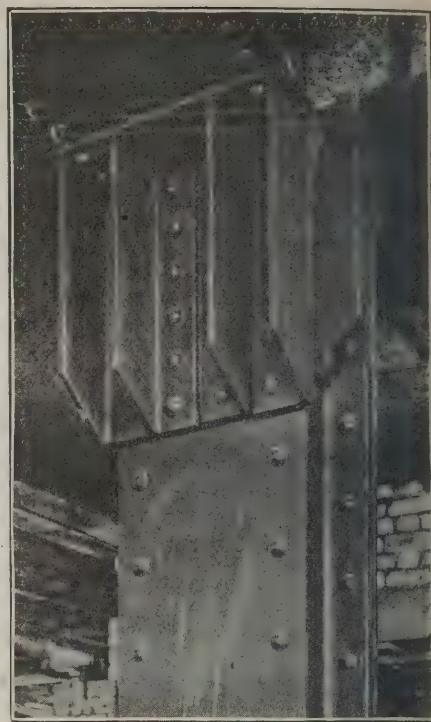


FIG. 2.

for March 22nd last. Expansion joints are provided at every floor level and the brackets are allowed to slide upon their supports. The space between the steel flue



FIG. 3.

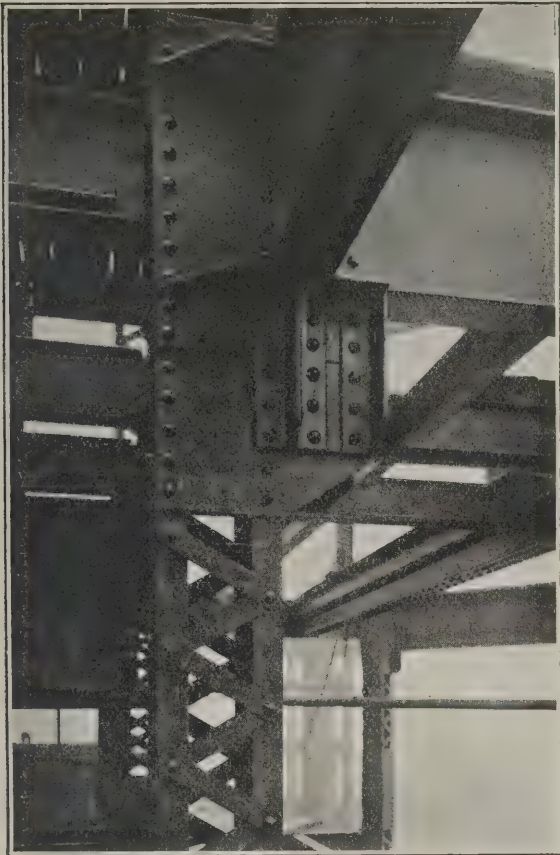


FIG. 4.

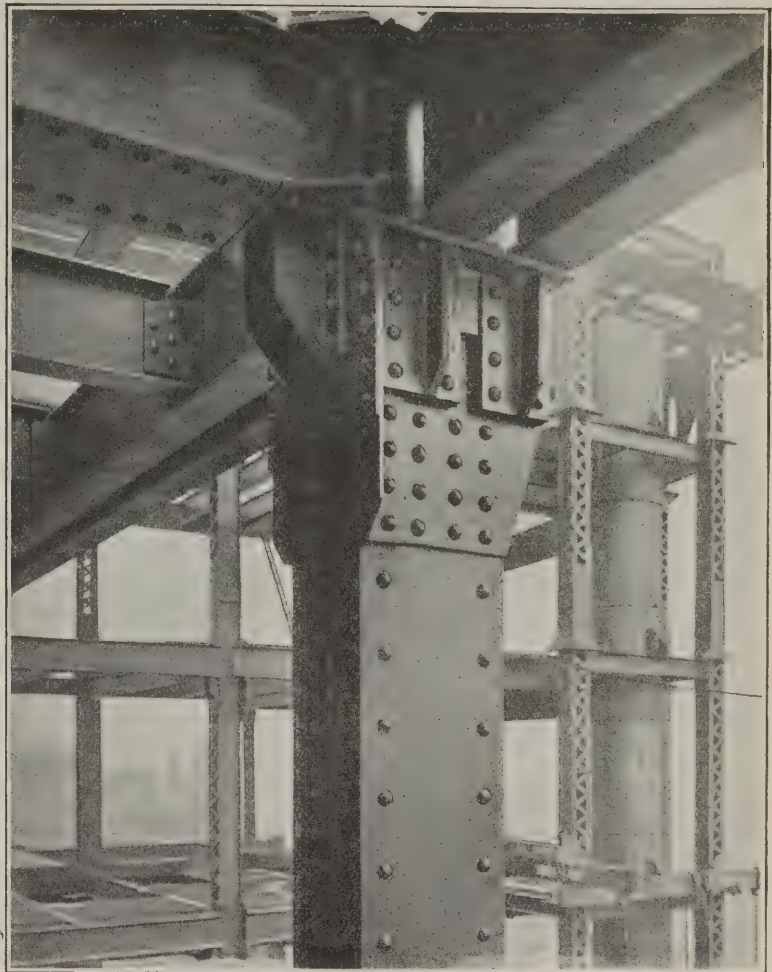


FIG. 5.

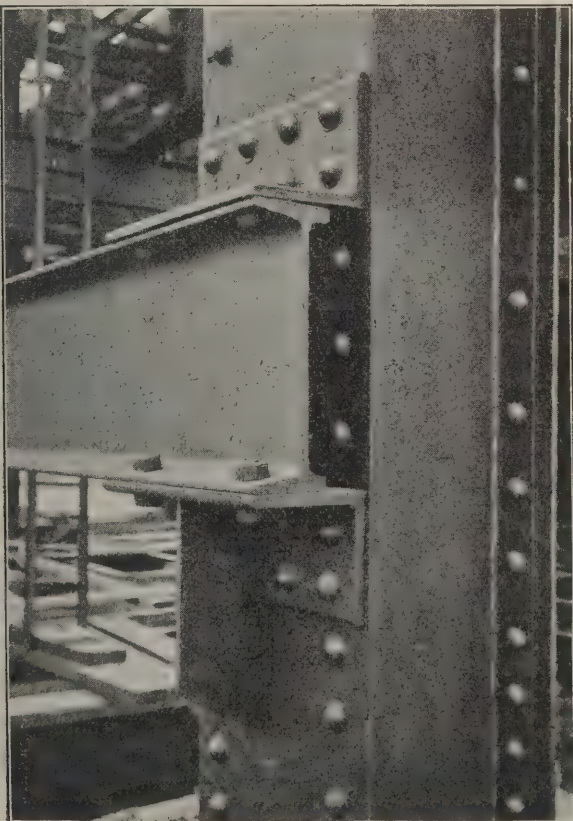


FIG. 6.

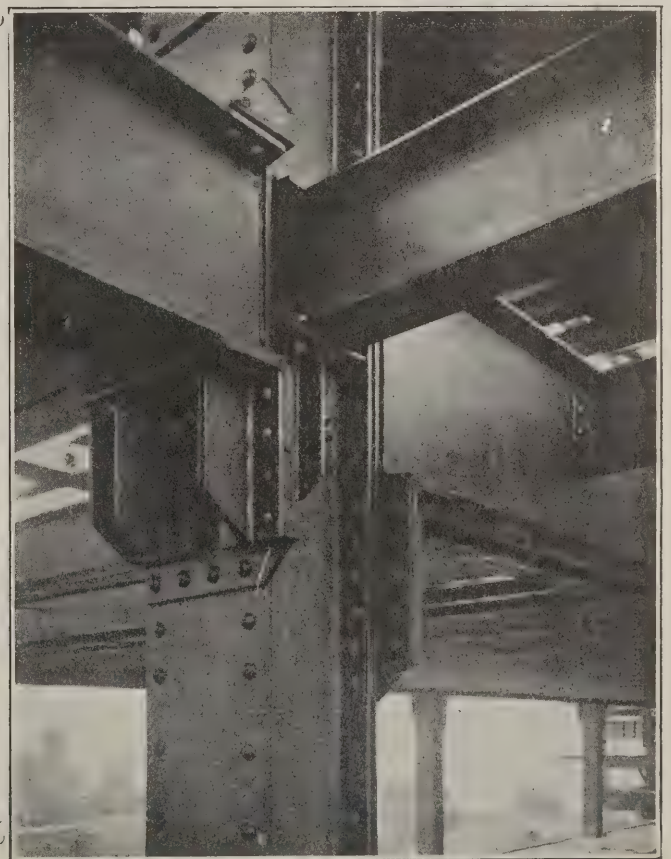
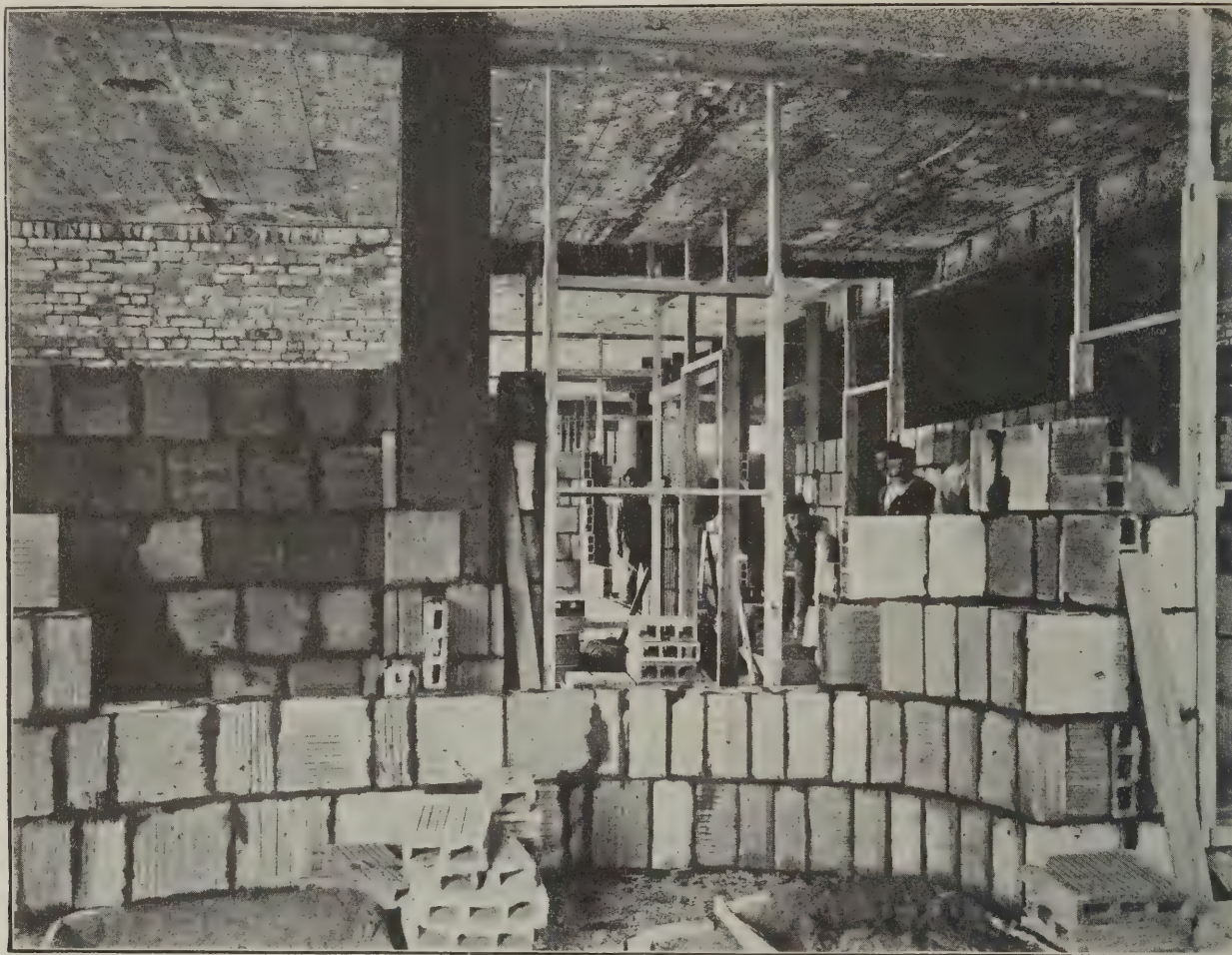


FIG. 7.

STEELWORK CONNECTIONS AT THE RITZ HOTEL, PICCADILLY LONDON.



ERECTING PARTITIONS AT THE RITZ HOTEL, PICCADILLY, LONDON.

and the walls is used for ventilation. It has already been explained how to read the framing plans in the issue of May 24th, in connection with the reproduction of the second-floor framing plan.

Trusses are placed between the first and second-floor levels in order to carry the part of the building over the dining-hall.

A shop detail drawing of one truss is shown on the opposite page. This truss is placed in partition walls, and door openings are provided through the truss at both ends under the large gusset-plates connecting the diagonal parts with the top cord. The two other trusses are similarly arranged. The trusses rest on columns Nos. 37, 55, 52, 54, 37 and 35. The loads from the trusses are applied about 7ins. out of the centre of the columns. The connections between the trusses and columns are very simple and thus facilitate erection. The top cords of the trusses are calculated for compression and bending. The bending is due to the weight of wall and floor, *i.e.*, the top cords act as floor girders at the same time as members of these trusses. The sum of the stresses exerted by compression and bending is less than 15,000lbs. per sq. in.

Fig. 7 shows the connections between a channel column and I-beams. On each flange side rests a compound girder 15ins. deep and on the near web-side an I-beam 12ins. deep. It should be carefully noticed how the beams are supported on angles and stiffeners. The number of rivets required in the stiffener-angles is calculated in accordance with the loads. The connection on the web side is the standard adopted throughout for 12in. I-beams.

Fig. 5 is a photograph of an exterior column to the court. In the background can be seen the smoke flue. The connection here illustrated is of two I-beams 15ins. deep resting one on each flange side of the column,

and a compound girder 12ins. deep on the web side. The width of the compound girder was too great to allow it to be placed in the channel, and therefore a gusset-plate was introduced, connected to angles riveted to the flanges of the column. When beams do not frame into the column centrally, it is sometimes difficult to obtain good connections; but if the system shown in Fig. 5 is adopted good connections can be obtained. One of the 15in. beams resting on the bracket on the flange side of the column is 7ins. out of the centre line of the column.

Fig. 4 shows a case where two deep beams are both out of the centre. The beam shown at right angles to the flange of the column is connected to and rests on a seat-angle only, but the beam at right-angle again to this is web-connected to a large gusset-plate on which the bracket with stiffener-angles is placed.

Figs. 1, 2 and 6 show the construction of brackets for different cases of framing.

Fig. 3 shows connections at the sixth-floor level, where the supports for the pavilions start. The ends of the hip-rafter were milled to dimensions for skews in two directions, and fitted exactly. To the left of the hip-rafter the mast of the guy-boom derrick used for hoisting stone can be seen. The signalling man is standing on a platform cantilevered out. In the background small derricks for setting stone are to be seen.

The importance of good and safe connections between columns and beams or girders is often ignored, but it should be remembered that the safety of a building is dependent on its weakest points; if one connection breaks it may cause the whole structure to collapse. If the factor of safety of the beam itself is 4 and for the connection is 2, the factor of safety for the structure should be considered as 2. It is more economical

to make the connections stronger than the beams. The collapse of the Darlington Hotel, New York, was due to poor connections between beams and columns.

OUR PLATE.

THE house at the Gallows Conduit, Coombe, for Mr. Valentine Knapp, is to be erected on a fine site overlooking Epsom and Banstead Downs. The materials are to be soft red bricks, red tiling for the roofs, and the external woodwork painted white. Decorative leadwork is to be introduced on the bays and executed from the designs of the architect, Mr. A. Jessop Hardwick, F.R.I.B.A., of Kingston-on-Thames. The hall will be panelled and a special feature will be made of an open staircase. The rainwater heads and gutter between bays are to be in lead.

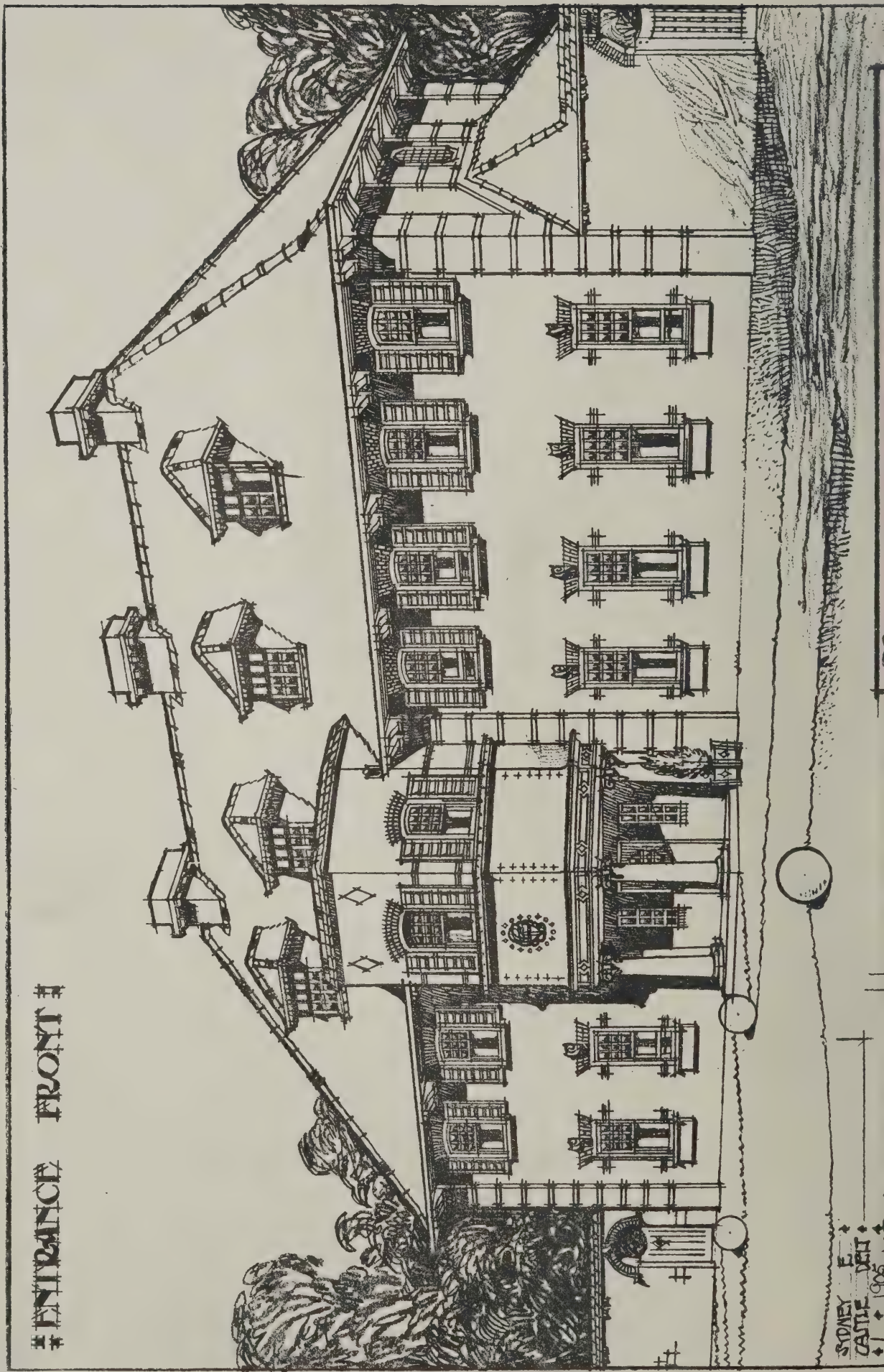
Change of Address.—Mr. W. H. Ansell, architect, has removed his office from Great James Street to No. 18, Guilford Street, Russell Square, W.C. (opposite the Foundling Hospital).

Serious Condition of Winchester Cathedral.—The cathedral architect (Mr. J. B. Colson), the diocesan architect (Mr. T. G. Jackson, R.A.) and the consulting engineer (Mr. Francis Fox) have delivered to the Dean and Chapter their report as to what should be done to the eastern end of Winchester Cathedral, which is in a very dangerous condition, the south-eastern walls being more than 1ft. out of plumb. The mischief has been growing to such an extent that the whole of that end is being shored up pending the consideration of the steps to be taken to restore the building. The north-eastern end of the cathedral is also weak, and the whole of the crypt is shored up to prevent cracking.

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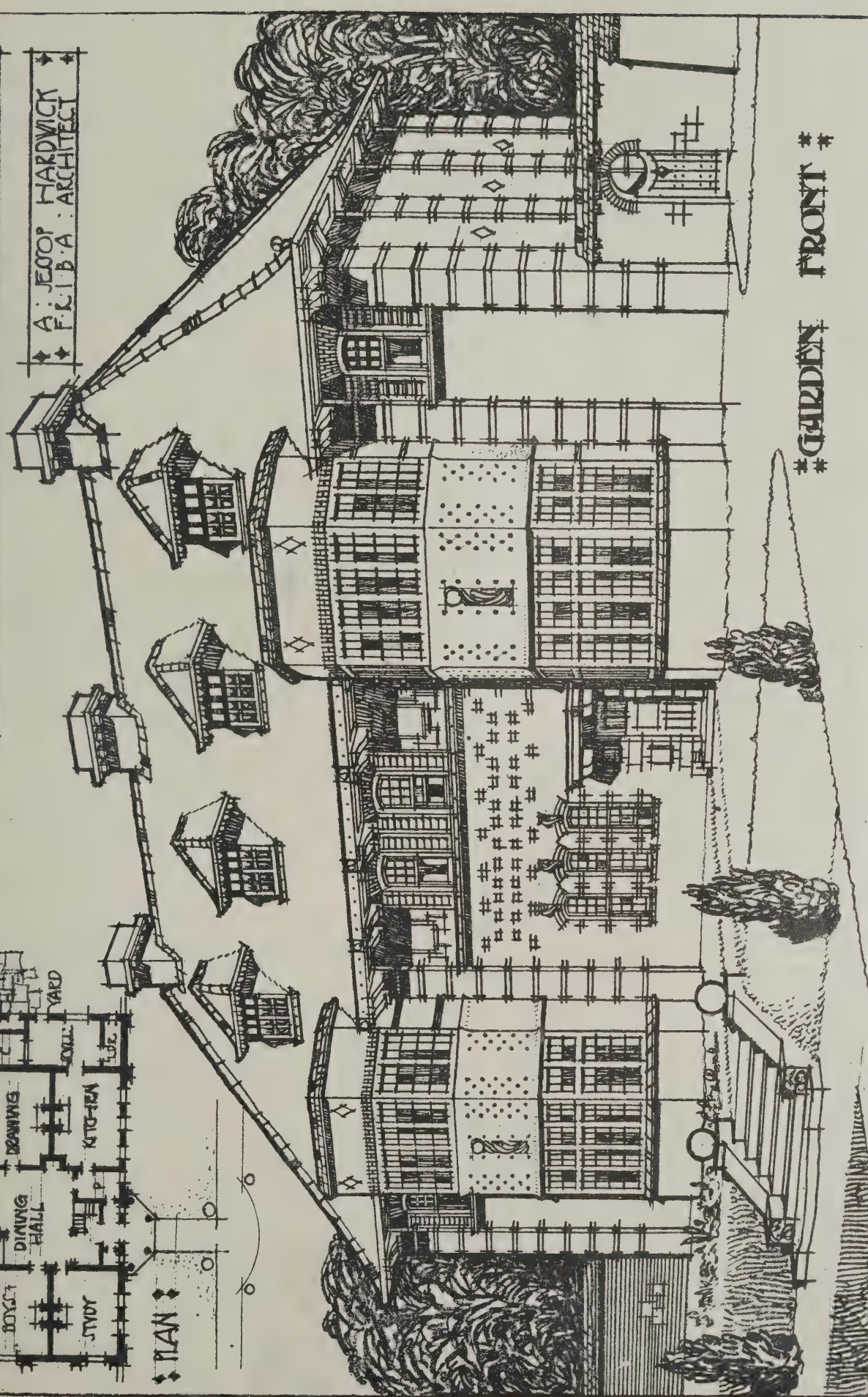
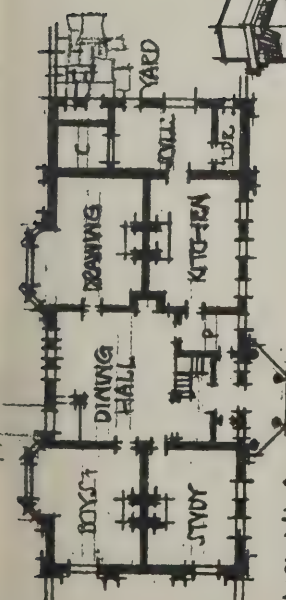
Supplement to
 THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
 Wednesday, September 13th, 1905.

ENTRANCE FRONT



H. GALLONS
 EDITOR VALENTINE KNAPP ESQ. VICE PRES.

A. JESOP HARDWICK
 F.L.S. B.A. ARCHITECT



GARDEN #
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Keystones.

The Quadrangle of Burlington House is to be paved with wood.

Mr. Ryan-Tenison, F.R.I.B.A., has been appointed consulting architect to the South-west Diocesan Schools Association.

The Organ at Winchester Cathedral is being cleaned and renovated by Messrs. Heel. It is hoped that the work will be finished by the end of the month.

New Slaughter-houses at Glasgow are to be erected on Merkland grounds, Whiteinch. The scheme, including the construction of cooling-rooms, cold stores and quays, will cost about £100,000.

The Simplex Steel Conduit Co., Ltd., of Westinghouse Building, Norfolk Street, Strand W.C., have just issued a new price sheet giving in a condensed form most of the prices in their 1905 catalogue.

A Hotel of Forty-two Storeys is to be erected in New York by a building corporation possessing a capital of £1,000,000. The new building will have 500 rooms, with dining- and ball-rooms on the top floor and Turkish swimming baths in the basement.

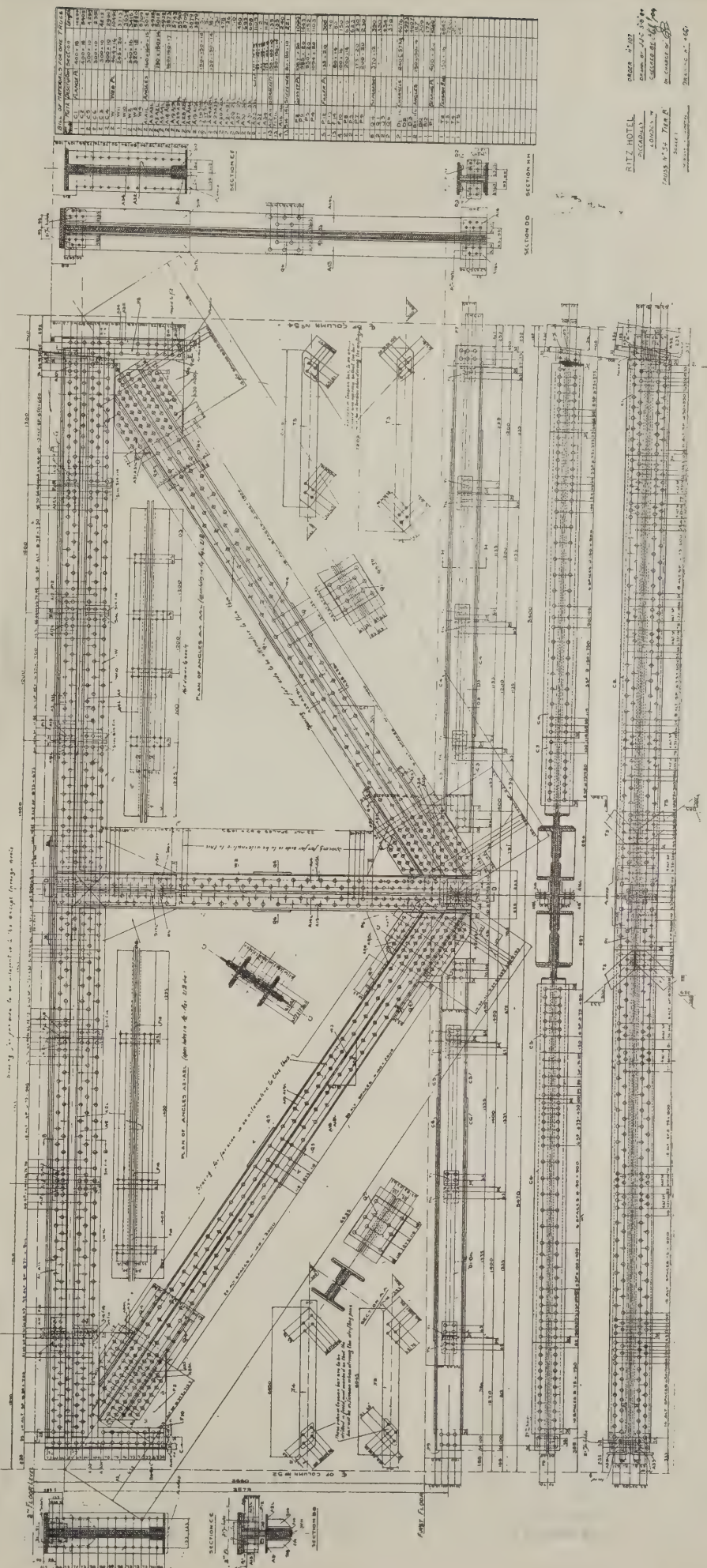
Mr. Stirling Lee and St. George's Hall.—At last week's meeting of the Liverpool City Council Mr. Stirling Lee's letter in regard to the completion of his sculpture work at St. George's Hall (see p. 143 of our issue for last week) was merely taken as read.

Cleaning the Law Courts.—The walls and ceilings in the corridors of the Royal Courts of Justice are being thoroughly cleaned for the first time since 1882; also the ventilation in the King's Bench Courts II., V., VIII. and IX. is being modernized.

The A.A. and the Royal Architectural Museum.—The accounts for the adaptation of the old Royal Architectural Museum in Tufton Street, Westminster, to the purposes of the Architectural Association state the contract of Messrs. Holloway Brothers to have been £8,111 and the legal expenses, the fees of the architect (Mr. Leonard Stokes), furniture and fittings £1,100—a total of £9,211. Towards this amount donations (with interest) amounting to £7,420 have been received, and promises totalling to £761 are outstanding, leaving a sum of £1,030 still required.

Eccles Parish Church: Ancient Part Crumbling.—The whole of the ancient part of Eccles Parish Church is in need of repair. Mr. F. P. Oakley, architect, of Manchester, who has examined the building, says the stonework generally has reached the point where further decay will be much more rapid than it has been up to now, and that the clearstory ought to be taken in hand at once. The water is now finding its way in, and that means rapid and certain disintegration. Mr. Oakley thinks the cost will probably be about £2,000, and of this the officers of the church ought to spend £1,000 without delay.

Roman Pavement at Dorchester.—A short time ago some Roman tessellated pavement was discovered on the site of the new Primitive Methodist schoolroom in Durngate Street, Dorchester. As this was of considerable interest the council of the Dorset County Museum decided to preserve it. They accordingly commissioned Messrs. B. Ward & Co., Ltd., of Parliament Street, Westminster, to take it up and relay it in cement on the floor of the museum, next to the piece of pavement discovered in Olga Road, which was also removed and relaid by Messrs. Ward, whose Italian workmen have had considerable experience of such work. The relaying and polishing of the Durngate Street pavement has now been completed and gives entire satisfaction.



PLAN OF RITZ HOTEL
 SCALE 1" = 10' 0"
 1905 N. 12. 1/2
 1905 N. 12. 1/2
 1905 N. 12. 1/2



CHURCH OF ST. CHAD, LONGSDON. GERALD C. HORSLEY, ARCHITECT.
(Royal Academy Exhibition, 1905.)

Views and Reviews.

Practical Gilding.

This is a very good practical book on gilding, bronzing and lacquering which should find its way into the hands of a large number of students and craftsmen. All branches of the work are dealt with, concisely and clearly, and a useful summary is given of the preparation of the various metals employed in gilding, both as leaf and powder. In referring to copper leaf the author takes occasion to mention that this might be more extensively used in decoration, by reason of its rich colour and lustre, and the permanence to be secured by lacquering.

We can recommend this book to all who want to know how all kinds of "gilding"—used in its widest sense—are carried out. The author is lecturer on decoration to the City and Guilds of London Institute and the London County Council.

"Practical Gilding, Bronzing and Lacquering," by Frederick Scott-Mitchell. London: Trade Papers Publishing Co., Ltd., 365, Birkbeck Bank Chambers, W.C., price 3s. nett.

Pumps.

In this volume the author briefly describes the various types of pumps, supplementing the letterpress by a number of diagrams and photographs of examples by different makers. To the architect the book is of no special interest, except in so far perhaps as concerns hand- and wind-power pumps. The objection to the latter is of course the uncertainty of the motive power, but as against this there is the minimum of cost for working and maintenance, and also the possibility of

employing tanks or reservoirs to hold three or four days' supply in order to cope with the vagaries of the wind. Chain pumps worked by wind engines are sometimes used for raising water from quarries and brick-yards, and to empty the workings; they are also very useful on estates where water collects to a considerable extent. Electric motors are coming more to the front for pumping purposes; but, as the author observes, the essential condition for their use is the possibility of obtaining current at a reasonable cost. The chief advantage of electric motors is that they are always ready for work, so that no time is lost in starting. We have already drawn attention to this fact in connection with the use of electric hoists on building works.

"British Progress in Pumps and Pumping Engines," by Philip R. Björli. London: Archibald Constable & Co., Ltd., 16, James's Street, Haymarket, price 6s. nett.

Academy Architecture.

The first part of "Academy Architecture" for 1905 is to hand. Naturally, such a publication, so well known to our readers and now in its seventeenth year, does not call for very much detailed comment; and we can only say that, as usual, it is admirably printed and that the plans throughout are clear and uniform. A large number of the exhibits in the architectural room at this year's Academy are included, together with drawings and photographs of work exhibited at the Royal Scottish Academy and the Royal Glasgow Institute of the Fine Arts, while in the latter part of the book are some photographs of sculpture and of work abroad. Among this last is a very interesting design for the Quirinal Tunnel at Rome. Two coloured plates by John Nash (1809–

1878), respectively of a chimneypiece in the drawing-room of Speke Hall and of the chapel at Ightham Mote, are included in the volume; both being very successful as examples of colour printing and draughtsmanship.

"Academy Architecture and Architectural Review, 1905." London: 58, Theobald's Road, price 4s. nett (paper covers).

A Standard Book on Hot-water Heating.

The subject of ventilation and heating is generally treated in its twofold aspect, and as such has been dealt with in numerous books. Usually, however, far too much space has been devoted to the theoretical and abstract side of the question, and very often the practical work has been described in a way savouring of the professor rather than of the working plumber and heating engineer. In the volume now before us Mr. Dye has wisely avoided the familiar treatment, and the result is that his book will find a place among standard treatises, not so much among "text-books," prepared for cramming students for examination, as among those very good books which deal exhaustively with their subject while not being too diffuse, and are written by people thoroughly conversant with the practical methods of execution in vogue. Beginning with a chapter on the laws of heat, the author proceeds to describe the circulation of hot water in pipes, and then explains in detail a hot-water heating apparatus. Low-pressure for brick buildings is then considered at length; after which follows a chapter on the heating of glass-houses and horticultural buildings; then a brief chapter on quantities, followed by one on the testing of heating plant when the outdoor temperature is more than 32 degs. (this last being a paper read before the Institution of Heating and Ventilating Engineers, for which the author was awarded a bronze medal). Drying-rooms are described, and Mr. Dye then goes on to deal with air in pipes, loss of heat, &c. Boilers and radiators are fully dealt with, after which the high-pressure system is explained, and at the end of the book comes a chapter on the warming of buildings by heated air, this last subject being divided into two parts, namely, warming by air that has received heat by passing over encased hot-water or steam radiators, and warming by stove-heated air. At the end of the book is an appendix giving tables and figures useful to heating engineers. The author points out in regard to boilers that he has not found it necessary to alter the new table of actual heating values he set up in the earlier editions of Hood on Warming Buildings; and although boiler-makers have not as yet based their calculations on figures quite as low, there is no gainsaying that they might with advantage do so, "for it is everywhere recognized, even among themselves, that something should be done, and will eventually be done, to give boilers more precise catalogue values than they now have."

The book is essentially practical, written by an acknowledged authority, and will be found of great service to architects, heating engineers and students.

"A Practical Treatise upon Warming Buildings by Hot Water," by Frederick Dye, M.R.I.E. London: E. & F. N. Spon, Ltd., 57, Haymarket, price 8s. 6d. nett.

Terry's Theatre, in the Strand, has been reconstructed inside. The Strand stairs to the upper circle and gallery have been rebuilt, a new stage roof has been erected, improvements have been made in the dressing-rooms, the small private boxes at the rear of the dress circle have been removed and the space thrown into the dress circle, with a walnut screen at the back, a new installation of electric light has been carried out, and the whole theatre re-decorated and re-upholstered. Mr. Frank Matcham was the architect in charge.

Builders' Notes.

Sheffield Builders, Ltd.—This company is to be wound up.

The Welsh Slate Trade, which has suffered by reason of the importation of French slates, has received a benefit by material reductions in the L. & N.W.R. rates to inland towns.

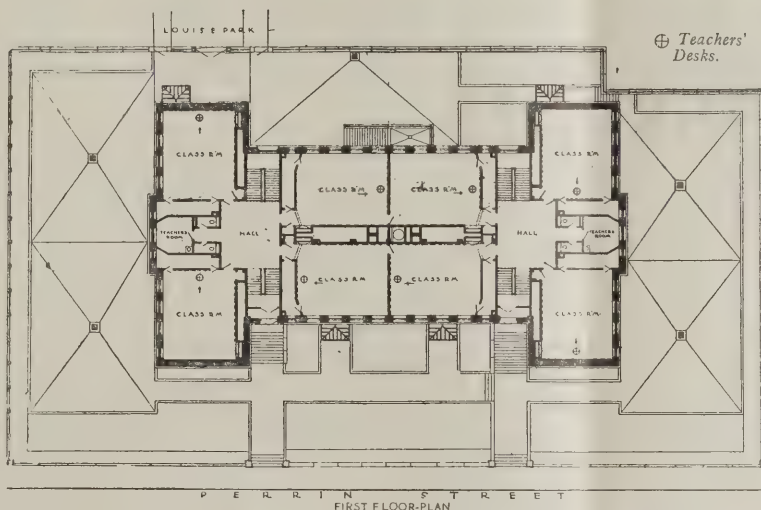
Iona Marble.—A Swedish firm has taken a lease of the old white and serpentine marble quarry on Iona Island (Argyll). Mining operations will be commenced next spring.

Sunderland Building Trade Dispute Settled.—The dispute in the building trade at Sunderland, which has lasted for fifteen weeks, has been settled by compromise. Work was resumed on Friday, the builders' labourers receiving 6½d. per hour and the bricklayers 9½d.

Master House-Painters and Decorators: Convention and Exhibition at Plymouth.—The National Association of Master House-Painters and Decorators will hold its twelfth annual convention and exhibition at Plymouth from September 19th to 23rd inclusive. The Guildhall has been secured for the purpose of the exhibition and meetings, and there is expected to be a large gathering from all parts of England and Wales. Mr. H. Vigurs Harris, of Plymouth, is the president. At the conference on Wednesday, September 20th, Mr. G. C. Haité, R.I., will deliver an address, Mr. W. Whitelaw will read a paper, and Mr. E. A. Bramley, headmaster of the Manchester association school for teaching decoration, will speak on "Methods of Training for Decorators."

Messrs. Patman & Fotheringham, Ltd., of 101 and 102 Theobald's Road, W.C., and Islington (managing director Mr. James F. Parker), have secured the contract for the alterations and reconstruction of the Avenue Theatre, Northumberland Avenue, which is to be done for Mr. Cyril Maude. The theatre will be re-named The Playhouse. Messrs. Patman & Fotheringham have also secured the following contracts:—The new Carnegie library, Mile End; the new Carnegie library, Manor Gardens, Islington; Messrs. Spalding & Hodge's new offices, Drury Lane, W.C.; the Talbot Restaurant, &c., London Wall, E.C.; and several others, amongst them being work for Lady Winchelsea at Haverholme Priory, Lincolnshire, the Earl of Dunraven at Connaught Square, W., and Mr. Leopold Albu at Hamilton Place, Park Lane, W.

A Visit to the Cheap Cottages Exhibition at Letchworth was paid recently by seventy or eighty visitors from Leeds, Bradford and the West Riding, including the Bradford Corporation Building Committee, over thirty medical officers from the West Riding, the members of the Leeds Corporation Plans Committee and the Unhealthy Areas Committee, and more than twenty representative workmen selected by the Leeds Co-operative Society. Summing up his general conclusions after a very careful examination of the houses, Alderman F. M. Lupton, chairman of the Unhealthy Areas Committee, said: "They are certainly no use for Leeds, and I do not think they are any good for outside the city. Some of the houses might suggest possible improvements in the better class of workmen's houses to be erected in Leeds, but none of the houses had advantages as compared with those already built on the Ivy House estate in Leeds. The only use these houses could be to us would be in case Leeds was to start building a garden city outside the present city boundaries. But many of the houses would not satisfy the by-laws, as in Leeds they insist upon all bedrooms, except attics, being not less than 9ft. high, and the bedrooms in nearly all



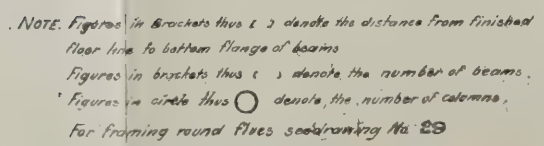
PRIMARY SCHOOL, BOSTON, MASS. J. A. SCHWEINFURTH AND J. J. CRAIG, ARCHITECTS.

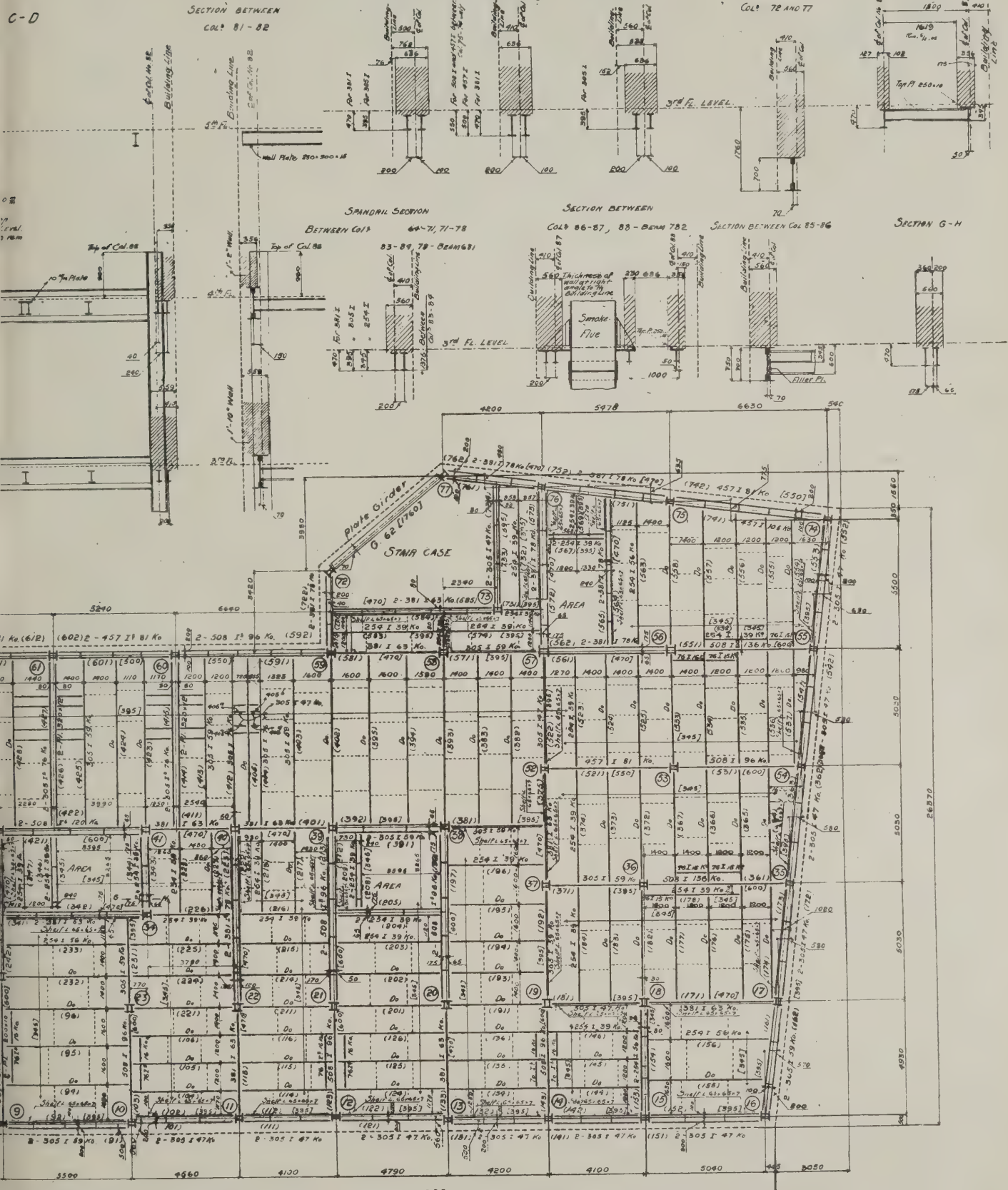
these exhibition cottages were only 8ft." On this point, however, Alderman Lupton was not sure that the Leeds law refusing to recognize anything lower than a third-storey room as an attic was altogether wise or reasonable. Another criticism he had to offer was that in a great many cases ventilation and light, especially in the bedrooms, had been sacrificed for what was supposed to be artistic effect.

Two Building Collapses.—An enquiry was held last week on the death of a workman named Hood, aged 29, who died as the result of injuries received by the collapse of a number of iron roof principals, weighing a ton each, which were being fixed recently at an extension of the Brentford market. James Cureton, foreman for Messrs. Colley & Cureton, of Trafford, Manchester, stated that he had charge of the ironwork which his firm were erecting for the Griffin Iron-works, of Birmingham. There were seven principals fixed and bolted securely, and he could not account for the work giving way. Walter Paggett deposed that he bolted the end principal securely. Mr. Longhurst, representing Messrs. Dorey & Co., the builders, said that if properly bolted he would not expect such a collapse. There was no wind, but there might have been vibration from a passing traction engine. The jury, in returning a verdict of "accidental death," expressed the opinion that the iron was not bolted. They added a rider that they considered there was negligence in not having the work properly fastened, and considered the man Paggett should be censured for the way he

had given evidence.—On Wednesday last at the foundation-stone laying of a new Baptist chapel at Ebbw Vale a portion of the scaffolding (about 30ft. long) upon which fifty or sixty people were standing collapsed, precipitating them to the ground 12ft. below. Twelve persons were injured. The accident was due to one of the stays breaking.

New Working Rules: Acceptance by Stonemasons.—The acceptance by the Operative Society of Stonemasons of the new working rules, after certain important concessions by the employers, brings half the trade unions in the building industry into agreement with the London Master-Builders' Association, who had given notice to terminate the existing agreement and had formulated new proposals. It is now believed that there is no danger of a disturbance in the industry such as appeared probable when the movement first commenced. No alteration in the present rate of wages is to be made, and the employers concede the amendment suggested by the operatives that there shall be one hour dinner instead of half an hour during the last three weeks of the winter work, and that the hour rule shall apply to work in shops as well as on jobs. They also withdraw their request for optional opening at 6.30 a.m. in winter, and for permission to otherwise vary the hours under "reasonable circumstances." A further important concession limits the night work, at the rate of 1d. an hour addition to the ordinary rate, to nine hours a shift. The London district is altered to mean within twelve miles of Charing Cross, instead of ten as formerly.





DRAWING N° 8

Correspondence.

Expansion of Concrete Floors.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In reference to the continued correspondence on this subject allow me to trespass once more on your space. Mr. Thomas Potter, in his very interesting letter, appearing in your issue for August 30th, expresses surprise that "limestone which in fire is rapidly converted into carbonate of lime is the best material for fireproofing." I did not actually say that it was, but presuming Mr. Potter really means that the carbonate of lime (CaCO_3) in the limestone is, by fire, converted into oxide of lime (CaO), I admit that this change does take place when unprotected limestone is subjected to sufficient heat to drive off the carbonic-acid gas. At the same time I have proved by experiment that limestone in concrete, gauged in the proportion say of 3 or 4 parts stone, 1 or 2 parts clean sand, and 1 part cement, is not affected by fire to any appreciable extent, for the reason that each particle of stone becomes covered with a protecting skin of sand and cement, and is thus rendered fireproof in exactly the same way as steel in ferro-concrete.—Yours truly,

W. A. T. FLITTON.

WELLINGBOROUGH.

PAINTS AND PAINT-WORK.—V.

(Continued from p. 27, No. 544.)

VEHICLES.—II. Turpentine.

THE function of turpentine is to act as a thinner, i.e., to so dilute the oil that the paint will spread over a larger surface and therefore be in contact with more oxygen, the drying agent. Turpentine, although it increases the drying action, does not itself act as a dryer, for such a substance must import oxygen into the oil. Properly speaking, turpentine is a solid or semi-resinous secretion obtained from trees, generally the coniferous kind, but the term is commonly applied to the spirit or oil of turpentine obtained from the solid form by distillation. The solid turpentine consists of a mixture of one or more true resins, resinous acids in which oxygen is present, and one or more liquid hydro-carbons, called chemically terpenes. These liquids are obtained by distilling the crude turpentine alone, with water, or in a current of steam. The solid left behind is resin or colophony. There are many varieties of oil of turpentine, but in the English market we are chiefly concerned with only three, namely, (1) American, (2) French, (3) Russian and Swedish, though the second is mostly consumed in France. The first is obtained from the *Pinus australis*, the swamp or Georgia pine, and from the *Pinus taeda*, the loblolly pine. French turpentine is obtained from the *Pinus maritima*, while the Russian and Swedish is obtained from the *Pinus sylvestris*, or Scotch pine, and the *Pinus ledebourdii*. These several varieties render commercial turpentine slightly different in composition and properties.

The swamp or Georgia pine of America grows in large forests in North and South Carolina, Georgia and Alabama. Carolina is the producer of the greater amount of American turpentine. The solid resinous turpentine is obtained in the winter from November to March. Cavities are cut in the trees about 1 ft. from the ground, and the sap when it begins to flow about the month of March collects in these holes and is removed. Another and better method is to collect the sap in glazed earthenware cups attached to the trees. This yields more turpentine and does not destroy the life of the tree.

The distillation of the crude turpentine is performed in a still, built with a fire under and a steam pipe passing through. The fire is first lighted, and when the temperature reaches a little above 100°C . the steam is let into the still. The oil of turpentine goes over with the steam and both condense together in a worm condenser. The resin left in the still is run off by a tap into barrels.

The maritime pine grows in the southwest of France, in the departments of Landes and Gironde. The trees are tapped in February and March, the sap being conducted into earthenware vessels. After five years' successive tapping the trees are allowed a few years for recovery. The French process of extraction is slightly different to the American. The resin is first melted at about 96°C . and the impurities allowed to settle; it is then placed in the still in measured quantities, and the temperature raised to 135°C . by means of a fire, when steam is injected. The volatile turpentine and steam is condensed in a worm, and the product allowed to stand until the water has settled to the bottom, when the turpentine is skimmed off. The resin residue in the still is run off and screened from dirt and grit. The oil of turpentine obtained is a little over one-fifth the amount of the crude resin. The French method is distinctly the most scientific.

Swedish and Russian turpentine is obtained very much in the same way as the American—that is to say, rather crudely.

The terpenes have the general formula $\text{C}_{10}\text{H}_{16}$, but they consist of a number of isomeric compounds, and the three varieties of turpentine on the market consist of mixtures of terpenes in varying proportions. Practically speaking, the turpentine-oils contain two terpenes only, namely, pinene and sylvestrene. Pinene, however, has two varieties, differing from each other in their action on a ray of polarized light; one is called lævo-pinene, and the other dextro-pinene.

American oil of turpentine contains both varieties of pinene, dextro-pinene predominating. French turpentine consists of lævo-pinene. Russian and Swedish turpentine consists chiefly of sylvestrene.

Pinene is a colourless liquid having a specific gravity of 0.86 and boiling at from 155°C . to 156°C . Sylvestrene is also colourless and liquid, with a specific gravity of 0.84 and a boiling point of 175°C .

French and American turpentines have a specific gravity ranging from 0.864 to 0.87, usually about 0.867, and begin to boil at from 150°C . to 160°C ., completely distilling at 170°C . They will flash at 36°C . to 38°C . and burn with a smoky flame.

Russian and Swedish turpentine has a specific gravity ranging from 0.862 to 0.873 and begins to boil at about 156°C ., completely distilling below 180°C ., the greater bulk at 172°C . to 174°C .

Oil of turpentine on exposure to air absorbs oxygen, slowly in the case of French and American and more rapidly in the case of Russian and Swedish. This oxidation renders the turpentine thick and viscid by the production of a resinous substance, which remains on exposure, part volatilizing away. When spread on a surface, as in paints, in a thin layer the larger proportion of the turpentine volatilizes, the residue being more completely oxidized than when in bulk and becoming hard. American turpentine has a greater absorbing power than French. With Russian and Swedish turpentine the more rapid absorption of oxygen and greater viscosity due thereto leaves a surface somewhat tacky for a time. This resinous residue left by turpentine upon drying acts as a binder for pigments, and in this respect differs from other spirits used in paintwork and its substitutes.

French and American turpentine when exposed to air in contact with water forms

a crystalline product having the composition $\text{C}_{10}\text{H}_{16}\text{O}_2$, named Sobrerol. Russian and Swedish turpentine oxidize in air into a substance called camphoric peroxide, with composition $\text{C}_{10}\text{H}_{14}\text{O}_4$. A peculiar property of this turpentine is that when heated with watercamphoric acid, $\text{C}_{10}\text{H}_{16}\text{O}_4$, and hydrogen peroxide, H_2O_2 , are formed, and this is availed of for the production of the well-known disinfectant "Sanitas."

The frequent adulteration of turpentine and the many substitutes for this very necessary diluent of paints render their consideration important, and in the next article of this series we shall deal with this branch of the subject.

(To be continued.)

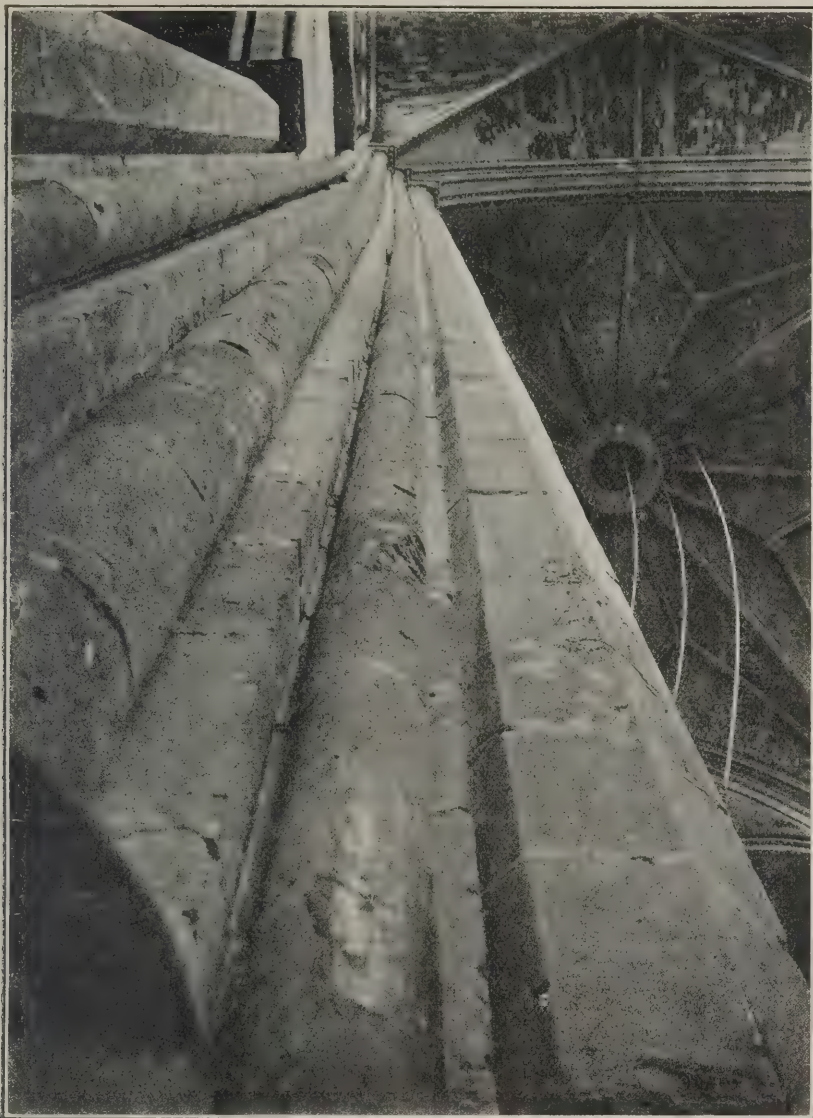
A LINCOLNSHIRE CHURCH AND SAXON ARCHITECTURE.

A DOUBT having been expressed as to the antiquity of Marton Church tower, Lincolnshire, the vicar (the Rev. I. H. Mallinder) wrote to the "Times" stating it was thought by experts highly probable that a Saxon church was built at Marton about 625, of which only the tower remains. "The late Bishop Trollop, who was a great authority on architecture, was of opinion that our church tower dated back to at least the eighth century. The Saxon church was replaced by an early Norman church built soon after the Norman Conquest, about the end of the eleventh century. The chancel arch is a beautiful specimen of early Norman work. The aisles and porch appear to have been rebuilt in the early part of the fifteenth century. The fine early Saxon 'rope' work masonry referred to by Prof. Brown is not built into the walls of the tower, but into the walls of the fifteenth-century part of the church. Thus these beautifully carved Saxon stones have been built into the walls of the church in order to preserve them, and are now in good preservation. The restoration of the tower is very urgent, and we are doing all we can locally to raise sufficient money to do the work, but as the parish is so very poor we are obliged to appeal for outside help."

As addition to the foregoing Prof. Baldwin Brown points out that the so-called "Lincolnshire" towers possessing Saxon features must be late in the style; first, because, taking Europe as a whole, the architectural type they represent and many of their features are comparatively late ones, and, next, because in England the distinctive features of these towers occur in some cases, as at Hornby, Yorkshire, in association with Norman or later characteristics. In the special case of Marton we have the fact that some herring-bone masonry in the tower, seen above in the interior, is curiously like some early Norman work at Tamworth Castle.

The Goldsmiths' Training College, New Cross, is to be altered and largely added to for the Delegacy University of London and St. John's College, Battersea, for the Governors and Council. Mr. A. H. Ryan-Tenison, F.R.I.B.A., is the architect.

The Tower of All Saints' Church, Asfordby, near Melton Mowbray, is in a dangerous condition. Mr. Goddard, architect, of Leicester, reports that it appears to have been cemented all over at some period with a view to arresting the decay. This cement has almost disappeared, except on the upper stage, where it remains fairly complete on all faces. The interior of the bell stage has also suffered seriously, and the arches supporting the haunches of the spire are cracked and much weathered, and in one place the stability has been endangered by cutting away stone to make room for the frame of the Jubilee bell. The cost of restoration is estimated at £346.



ARCHITECTURAL REFINEMENTS: VIEW LOOKING UP THE SOUTH-WEST PIER AT THE CROSSING OF THE CHURCH OF ST. QUENTIN.

THE GOODYEAR EXHIBITION.

Architectural Refinements in Mediaeval Buildings.

THE collection of photographs and surveys of architectural refinements in mediæval buildings in Europe brought together through the researches of Mr. W. Henry Goodyear, M.A., curator of Fine Arts in the Brooklyn Museum, is now on exhibition at the National Portrait Gallery, Queen Street, Edinburgh, the exhibition having been opened on Wednesday last by the Earl of Wemyss. As our readers are aware it is under the auspices of the Edinburgh Architectural Association. A very admirable catalogue has been issued in connection with the exhibition, containing a number of photographs of notable examples, including those of St. Mark's, Venice; the cloister of the Celestines, Bologna; Pisa Cathedral; Amiens Cathedral; Notre-Dame, Paris, &c. The studies represented by the exhibition began at Pisa in 1870, but were then discontinued till 1895, when the Brooklyn Museum of Arts and Sciences undertook the prosecution of the investigation, and a qualified architectural surveyor and engineering expert, Mr. John W. McKecknie, was selected as assistant to Mr. Goodyear. The results of the investigation are certainly very interesting. The architectural refinements practised by the Greeks—such as the curvature of the entablature and stylobate and the inclination of the columns of the Parthenon—are well-known, but it is worth

noting that our knowledge of these is only comparatively recent. Cockerell first noticed the Greek entasis in 1810, and Pennethorne discovered the Greek horizontal curves in 1837, but the scientific resolution of the whole matter was left to Penrose as late as the middle of the last century. With mediæval architecture we are not accustomed to associate architectural refinements of a similar nature to those of Greece, but everything seems to show that such refinements undoubtedly exist. The case is very well stated in the catalogue before us, and we cannot do better than give the following argument put forward by Mr. Goodyear:—

“Modern architecture has gradually drifted since the close of the sixteenth century into a mechanical formalism of mathematically exact symmetry and monotonous repetition of details. This formalism contrasts very unfavourably with the work of older periods. This older work was very largely dependent upon accidental conditions and causes for its more spontaneous, more varied and more picturesque character. The difference between old and modern work is largely determined by changes in social organism and business system, which have eliminated the accidental element. Aside from this accidental element the builders of the Middle Ages frequently practised predetermined and carefully considered constructive arrangements, which were intended to make their buildings more imposing, more attractive and more interest-

ing to the eye. In certain cases optical effects were undoubtedly studied, such as an illusive perspective in the apparent distance of the choir, or the avoidance of a contracted appearance in the upper part of a church interior. In other cases it may be a debatable point how far optical effects were studied, or how far the simple principle of the agreeable and picturesque effect of varied arrangements may serve as explanation.”

In illustration of the subject we give the accompanying view looking up the south-west pier at the crossing of the Church of St. Quentin, showing the vertical westward curves for the transept. These features are uniform in eight piers, and as it is difficult to conceive a single pier as being bent by thrust in two directions at right angles to one another in this regular manner, and still more difficult to conceive of a uniform occurrence of this “accident” in eight piers, one is led inevitably to the conclusion that the curvature was made with intention of architectural refinement. The illustration is taken from the exhibition catalogue, and we are indebted to Mr. H. W. Resmond, editor of the “Architectural Record Magazine,” of New York, for its use.

THE NEW SESSIONS HOUSE.

THE walls of the new Sessions House in Old Bailey, built of huge blocks of Portland stone, already appear above the network of scaffolding, and the central dome is rapidly attaining its complete height of more than 200ft. Surmounting the dome will be a bronze figure of Justice. The stonework is expected to be finished in less than three months' time. Inside, most of the marble slabs extending up to the springing of the dome have already been placed in position, while the pendentives bearing sculptured figures are nearing completion. Running north and south out of the central space beneath the dome are wide corridors lined with polished marble, and leading out of these corridors are the entrances to the four courts—two small and two large. Each court will be provided with a public balcony with an exit in Newgate Street. Ample light will be admitted through a dome-shaped roof of opaque glass. Each court, also, will possess its own suite of rooms for the accommodation of counsel, jury, the Press, witnesses in waiting and for private consultations. The courts throughout will have oak dadoes. The main staircase of marble is not yet completed. On the second floor are most of the rooms which will be used as offices by the staff. From the windows can be seen the two courtyards dividing the building. The walls of these courts are faced with white-glazed bricks. It is interesting to note that in one of the courtyards the bricks are built on to a part of the old London Wall, discovered while the excavations were in progress. On this floor is a large dining-hall and an adjoining smoking-room, the kitchens being at the top of the building. This section of the building on the south side is well forward and the mosaic flooring is being laid. From the ground floor a stairway leads down to the cells—upwards of 100 in number and constructed on the usual lines, with doors opening out on to a long passage. In the basement is the ventilating plant. Eight large fans will drive the air into a long circular duct, from which it will be forced through flues to every cell and room in the building, the extraction being through outlets on the roof.

Mr. E. W. Mountford, F.R.I.B.A., is the architect of the building. Mr. Pomeroy is executing the decorative sculpture; and Sir William Richmond and Professor Moira will paint some lunettes inside. The building will be opened in November, 1906.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Assistant Architect and Surveyor, Office of Works.

HORSHAM.—R. J. B. writes: "Please advise me as to how to obtain an appointment as assistant architect and surveyor in H.M. Office of Works."

Full particulars of this examination may be obtained by applying to the secretary of the Civil Service Commission, Burlington House, W. H. M.

Skelton Church, Yorks.

BRADFORD.—C. E. M. writes: "Would Skelton Church, near York, be accepted as a building to be measured for Final testimony? Would it be suitable and not too difficult? How many sketches and notes on the progress of buildings are usually sent in?"

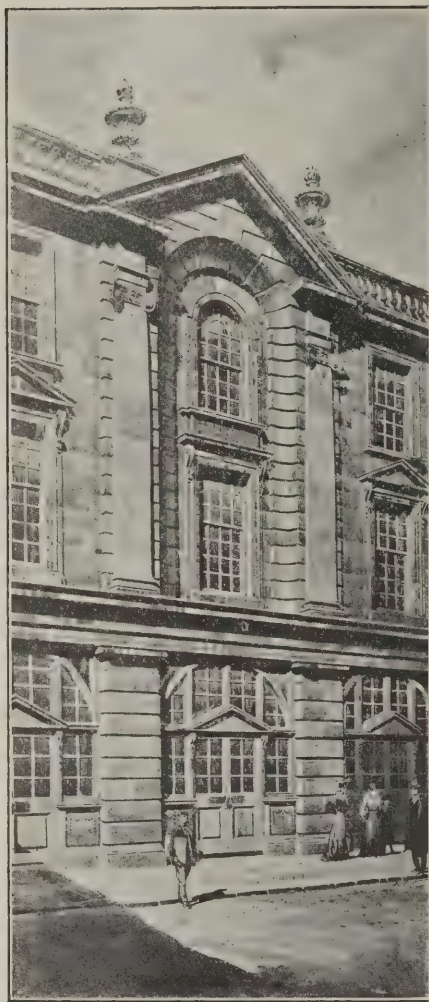
Measured drawings of Skelton Church, Yorkshire, would make a most excellent subject for a Final testimony of study. This church is small and rather uninteresting in plan, having no chancel or aisles, a fact which renders the measurement of the plan a very simple matter. The detail, however, is exceedingly rich and will take some time to measure properly; but it will be found that many of the mouldings are repeated in various parts of the church, and so the labour of measuring is less than would seem at first sight. The church was restored in 1847, but for the most part faithfully, except the vaults, which, however, are designed in keeping with the rest of the church; the south porch is particularly fine and makes an excellent subject for a sketch, especially if the door be opened and a view of the internal piers be included. There is a very interesting tradition in the parish of Skelton to the effect that the church was built of the stones that remained after the building of the south transept of York Minster, to which the character of the work corresponds very closely. The date of completion of Skelton Church is fixed absolutely by an entry in the Roll of Archbishop Walter Grey, which assigns it to the year 1247. A very fine set of sketches and measured drawings of Skelton Church was published shortly after its restoration in a book entitled "Skelton Church," by Ewan Christian, and issued by George Bell, 186, Fleet Street. A copy of this work is to be found in the library of the R.I.B.A. If you have a large number of sketches, you had better make a selection of the best; if a few, send them all in. If you send in too many they will not all be seen, while if you send in only a few the examiners may think you have been wasting your time. This same remark applies to notes on the progress of buildings.

H. Y. M.

Pozzo's "Perspective."

BIRKENHEAD.—H. E. F. writes: "Some time ago I picked up a book on perspective by Andrea Pozzo. It is fairly old, dating back to Queen Anne, and gives drawings of all the Orders of architecture in perspective. Is it valuable?"

Pozzo's "Perspective" is only worth a few shillings. Mr. Batsford, of 94, High Holborn, has two or three copies he would be glad to sell for 7s. 6d. each.



CROWN BREWERY, NEW ORCHARD STREET, BATH. SILCOCK AND REAY, ARCHITECTS. (Royal Academy Exhibition, 1905.)

Buildings to Measure in Hampshire.

HARTLEY WINTNEY.—S. P. writes: "Please name some architectural subjects near here suitable to measure for the R.I.B.A."

The following buildings, in the neighbourhood of Hartley Wintney possess suitable features for measuring and sketching:—Winchfield Church, the nave of which is Norman and the chancel Early English; All Saints' Church, Odiham, which has Early English, Decorated and Perpendicular portions; and the churches at Alton, Basingstoke, Basing and Bramshot, which are all Perpendicular. There is also a church at Hartley Wintney, but it has been very much restored. In this district are Bramshill, a very fine Jacobean mansion built 1607-12, and Hackwood, built to the design of Inigo Jones.

H. Y. M.

What is a Cross-wall?

PETERSFIELD.—H. T. K. writes: "In the Model by-laws a 'cross-wall' is said to determine the length of external or party-walls in regard to the thickness required, but there is no definition of a cross-wall, neither do 'Knight's Annotated By-laws' explain the matter. Would a cross-wall be correctly defined as a wall extending from one external wall or from one party-wall to another external or party-wall? Could a length of return wall of the required thickness terminated by a half-brick partition be legally considered a cross-wall? And how would the doorway next the wall whose length is to be determined by the cross-wall affect the question? Sketch sent (not reproduced)."

I am of opinion that both the walls shown in your sketch can be properly described as cross-walls—though I am not aware of any direct legal decision on the subject. The

definition given in the first schedule of the London Building Act, 1894, of what is not a cross-wall may be of interest to you: "No wall subdividing any building shall be deemed to be a cross-wall unless it is carried up to the floor of the topmost storey, and unless in each storey the aggregate extent of the vertical faces or elevations of all the recesses and that of all the openings therein taken together does not exceed one-half of the whole extent of the vertical face or elevation of the wall." F. S. I.

Distemper peeling off Damp Walls.

LEICESTER.—J. F. J. G. writes: "Which is the way to prevent distemper peeling off an old plastered wall that is damp?"

You should use one of the damp-resisting preparations now supplied by washable distemper manufacturers as a first coat and then apply a washable distemper.

Removing a Church to Another Site.

Mr. F. E. L. Harris, A.R.I.B.A., of Alderley Edge, Cheshire, writes as follows in reference to the enquiry under the above heading on p. 140 of our issue for last week: "I very well remember the taking down (for street improvement) of the fifteenth-century church of St. Werburgh, at Bristol, and its removal to a suburban site at Mina Road. This took place about twenty-five years ago. The stones were carefully taken to the new site and refixed, new ones only being used where found necessary. The church is a good example of the period named, with a fine tower of the Somersetshire type. I do not remember the name of the architect who superintended the removal and erection of the building."

Cream Rough-cast; Hoop-iron in Foundations.

BRIXTON.—J. J. writes: "(1) What are the best materials, proportions and method of laying to produce a rich cream-coloured rough-cast of fairly even surface, and would any precautions be necessary to carry out this work during frosty weather? (2) How should hoop-iron bond be used in footings to hold walls together when building on a clay foundation?"

(1) We suggest the use of clean sharp pea-gravel, Portland cement, Bath stone dust and powdered whiting, with a small amount of ochre to give tint. The proportions should be 2 Portland cement, 1 gravel, 2 Bath stone dust, $\frac{1}{10}$ th powdered whiting. The joints should be raked out and the brickwork cleaned and thoroughly wetted; the rough-cast should be mixed in small quantities and dashed-on with a trowel, or better a piece of board shaped with a handle. The work ought not to be done in frosty weather, and fine nights should be waited for. The precaution should then be taken to cover the work with sacks or matting.

(2) We do not see the advisability of using hoop-iron bond at all. If the foundations are proportioned so as to have the same load per unit of area, the building will settle uniformly. The foundations should be concrete, plain or reinforced, and the footings should start therefrom in regular offsets. If hoop-iron bond were introduced it should be placed longitudinally in the centre of each brick and crossed by short transverse pieces likewise placed in the centre of each brick. This would ensure the pressure being evenly distributed over the whole area, but such a precaution would be seldom necessary. There is, however, the patented system of the Fireproof Partition and Spandrel Wall Co., of 92, Tooley Street, S.E., in which hoop-iron is introduced horizontally and vertically in walls so as to render them self-supporting over small spans, so that foundations are only required under the supporting piers, wooden pillars or stanchions that occur at intervals and corners, and to which the hoop-iron is fastened longitudinally.

THE TIMBER TRADE.

London Market in August.

LAST week we published a special report of the Liverpool timber market during August. We now give a report of the London market.

The trade for the month was steady. The overside deliveries, to which some attention may be paid at this time of year, have been good, and the reduction in the dock deliveries as compared with last year amounts only to about 900 standards. Taking the two together, there is a credit balance in favour of this August of 1,200 standards. Messrs. Churchill & Sim report that the importation from Sweden has been a large one, but this has been fairly counterbalanced by an unusual reduction in the quantities arriving from the Russian ports, so that the dock stocks may still be reckoned at, say, 18,000 standards less than at this time last year. Prices were rather more than maintained throughout the month, but it has to be remembered that they are nevertheless altogether unsatisfactory both to shippers and importers. Swedish shippers are trying hard to raise them, and to some extent succeeding, but at the cost of doing very little business. Russian shippers are rather taking advantage of this, and a considerable amount of Russian business was effected during the month for autumn shipment away from London, but at rates entirely in the buyers' favour. Freights continued steady, the tendency towards the usual autumn stiffening being rather nominal.

Messrs. Denny, Mott & Dickson, Ltd., express the opinion that the conclusion of the war in the East will serve to strengthen the wide expectation that the concluding quarter of the year will develop general business in all directions, and will, therefore, appreciably benefit the timber trade.

The abstract of dock stock, consumption, &c., for August, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on August 31st was:—

	Pieces.
Foreign deals and ends - - -	1,735,000
Do. battens - - -	2,372,000
Pine deals and battens - - -	951,000
Spruce do. do. - - -	777,000
Boards, rough - - -	3,735,000
Do. prepared - - -	7,045,000

Totalling 16,615,000 pieces, as compared with 18,284,000 in 1904, 18,466,000 in 1903, and 22,050,000 in 1902.

In other kinds the stock was as follows:—

Foreign wainscot logs - - -	173 pieces.
Do. oak timber - - -	921 loads.
Do. fir timber - - -	661 do.
Do. Oregon pine, &c., spars and masts - - -	3,633 do.
Colonial oak timber - - -	1,302 do.
Do. birch timber and planks - - -	5,991 do.
Do. elm and ash timber - - -	641 do.
Do. yellow pine - - -	671 do.
Do. red pine - - -	94 do.
United States pitch-pine timber - - -	13,867 do.
Do. do. deals - - -	39,000 pieces.
East India teak - - -	7,548 loads.

The deliveries for the first eight months have been:—

	Pieces.
Foreign deals and ends - - -	2,070,000
Do. battens - - -	3,880,000

	Pieces.
Pine deals and battens - - -	705,000
Spruce do. do. - - -	974,000
Boards, rough - - -	3,597,000
Do. prepared - - -	10,119,000

Totalling 21,345,000 pieces, as compared with 23,215,000 in 1904, 24,809,000 in 1903, and 25,794,000 in 1902.

The deliveries for August

have been:—

	Pieces.
Foreign deals and ends - - -	232,000
Do. battens - - -	415,000
Pine deals and battens - - -	63,000
Spruce do. do. - - -	92,000
Boards, rough - - -	393,000
Do. prepared - - -	1,078,000

Totalling 2,273,000 pieces, as compared with 2,387,000 in 1904, 2,442,000 in 1903, and 2,832,000 in 1902.

Deliveries from Ship to Craft.

The deliveries direct from ship to craft for the first eight months of the year have been:—

	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens	79,015	74,435	75,364	73,391
Boards - - -	16,785	13,565	16,191	16,865
Total - - -	95,800	88,000	91,555	90,256

and for August:—

	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens	15,185	13,961	20,154	22,612
Boards - - -	3,593	2,590	2,585	2,697
Total - - -	18,688	16,551	22,739	25,309

Soft Woods.

Swedish Deals and Boards.—Messrs. Churchill & Sim report that there were considerable arrivals of wood-laden ships from the Swedish ports in August. A large proportion of this importation has been delivered overside for more or less direct consumption, and the remainder has not overtaken the rather feeble powers of the market. Prices for deals and battens, therefore, may be said to have been a point better than in July. Deals remain unfashionable, and will only realize even present current values when really up to the mark as to quality and condition. In London such deals are none too plentiful, and many recent low prices are to be accounted for by faults of this description. Prepared boards have arrived in considerable quantities, and it has been difficult to prevent a further fall in prices. For the Cape the demand does not improve, and such specifications as are required for are very deficient in deal sizes.

Norwegian Boards.—The importation of Norwegian flooring boards was comparatively large in August, and the demand not being strong it has not been easy to maintain prices. The market has just about held steady, but with an inclination to fall under the July rates rather than in any way to recover from them.

Russian Deals.—The arrivals during August from the Russian ports were quite unusually light. Merchants here have been too much occupied with their early purchases to think of fresh business, and shippers have turned to other markets rather than send goods to London unsold. Much of the stock that has come to London has been very faulty, shaken and stained; and hardly affords any criterion of what the market might be for deals properly answering to their description. Claims have been heavy and numerous, and their settlement has been difficult and costly. Something of the prevailing political unrest has shown

itself in difficulties at sawmills and loading places, which have told severely against shippers in their endeavours to carry through their contracts. With all this, prices in London were quite fully maintained and on the whole were better than they were in July.

Finnish Battens.—The importation in August was quite normal, and, with a light stock, prices for battens were easily maintained and were perhaps a little better than they were in July. Here, again, much depends on quality and condition; a bright, square parcel of 2ins. by 4ins. will fetch quite a respectable price as things go, but they are not sent to London much, and the difference between them and the stained and waney scantling of which we see so many is a larger one than shippers will appreciate. 2ins. by 3ins. are out of favour for the moment. All whitewood is improving.

Prussian Timber.—The arrivals of fir timber from Prussia have been rather more in evidence than of late, but they have not been kindly welcomed, and prices are a little lower than before. Oak timber has been held with unusual firmness, the stock being in small compass, but the demand has fallen away very much, and if any quantity was sent here prices could not be maintained.

Canadian Timber.—The Canadian pine deal market in London was disappointing last month. The supplies were fairly large, very costly, and very difficult to move into consumption. Prices gave a little where there was any attempt at pressure, but for the most part sellers were quietly waiting for some signs of a demand. For spruce deals the market was firmer, more in sympathy with other markets and the general improvement in all whitewood, than from any increase in the demand in London. This movement looks like gathering force as the autumn proceeds, unless checked by shipments from Riga. Elm and ash timber are a point or two better since July. Birch has been selling cheaply in consequence of an over-supply. Oak and yellow-pine timber are without change. From the pitch-pine ports the only addition to the London supply in August was about 1,500 loads of sawn timber, so that previous deficiencies are not helped and the stock is the smallest for many a year past. Unfortunately, the demand is in much the same condition, and the timber is moving out of the docks very slowly; but notwithstanding this it has been realized that prices are too low, and there has been quite a smart lift in the market, say 2s. 6d. a load or more. Deals also are short in stock, and although the demand is fitful, prices are up a point or two.

American Whitewood.—First quality is weaker in consequence of increased imports, while the supply of the lower grades is far in excess of the demand; prices range from 2s. 3d. to 3s. 6d. per cub. ft. for first quality, 1s. 9d. to 2s. for clear saps, 1s. 6d. to 1s. 9d. for medium, 1s. to 1s. 2d. for culls. Logs are not wanted.

Hardwoods.

Teak.—Messrs. Denny, Mott & Dickson, Ltd., state that the landings in the docks in London during August consisted of 556 loads of logs and 401 loads of planks and

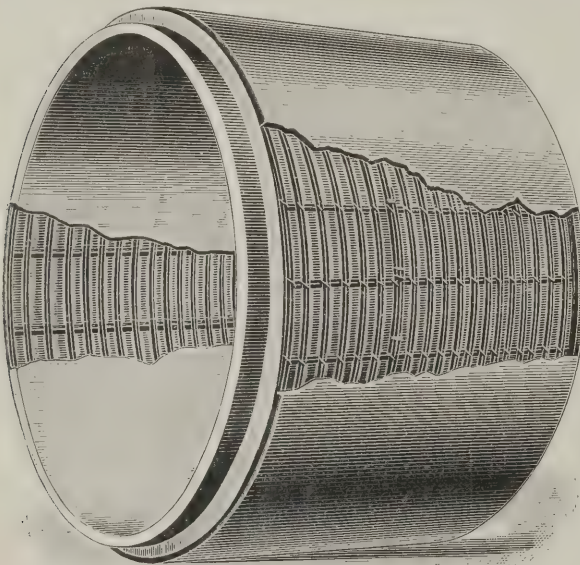
ABSTRACT OF STOCK, CONSUMPTION, &c., FOR AUGUST.

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock	1,478,829	2,588,318	951,066	777,259	38,214	5,833,686	3,724,433	7,044,748	19,500
Monthly public dock consumption	208,915	459,189	64,820	93,531	6,846	833,301	396,386	1,107,835	2,287
Overside stock	795,966	1,749,510	246,964	356,353	—	3,148,793	1,510,231	819,798	—
Overside consumption (estimated of dock):—									
82 per cent. Sawn	171,310	376,535	53,152	76,695	—	677,692	325,037	609,309	—
55 per cent. Planed									
Duration of supply at same rate of consumption	5'98 months.	5'19 months.	10'16 months.	6'66 months.	5'58 months.	5'94 months.	7'27 months.	4'58 months.	8'53 months.

scantlings, or a total of 957 loads, as against 432 loads for the corresponding month of last year. The deliveries into consumption were 215 loads of logs and 172 loads of planks and scantlings—together, 387 loads, as against 788 loads for August, 1904. During August the market was very inactive. Consumers naturally only buy from hand to mouth at the present high level of price. The advices from India continue to accentuate the fact that the outget of the new season's trees from the forests will be so small that next year's shipments of European quality must be very inadequate to the demand. Good quality wood must, therefore, continue to advance in cost; whilst, seeing that the quality will not be sufficient to "go round," consumers who do not promptly cover their requirements well forward will be driven to supply their needs from inferior shipments. China and Japan, however, are now absorbing such immense quantities of such second-class wood that it is very doubtful if much of even this description can be counted upon for shipment to Europe unless against special orders for execution a long time ahead.

Mahogany.—The arrival of the first cargo of the new season's wood from Honduras has brightened the market, and prices generally have rather hardened owing to the appreciation of a chance of business being lifted from the rut to which unduly light supplies have so long confined it.

Odessa Oak.—This market has been inactive, as all available supplies for some time ahead have been allocated.



"BONNA" ARMoured CONCRETE PIPE, AS MADE BY THE COLUMBIAN FIREPROOFING CO. LTD.

REINFORCED CONCRETE PIPES.

IN connection with the Swansea waterworks extension it has been decided to adopt reinforced concrete pipes for about a mile of high-pressure water main of 18ins. diameter, with a working pressure of 150ft. head. This is interesting as being the first use in this country of such pipes for the conveyance of fluids under pressure. For some time reinforced concrete pipes have been used for sewers, but not for water mains. On the Continent, however, the Bonna system has been largely adopted, and this same system is to be used at Swansea, the contract having been let to the Columbian Fireproofing Co., Ltd., of 37, King William Street, who are the concessionaires of the system for this country. We give an illustration on this page showing one of the pipes. It will be seen that the reinforcement consists of Latin cross bars wound spirally inside and out of a sheet of steel tube, these bars being secured by smaller longitudinal bars of Maltese cross section. Where pipes are not for pressure this steel sheet is not required, serving only to prevent penetration of moisture before the pipe is thoroughly matured and becomes perfectly hard. The concrete is composed of cement and sand mixed to the consistency of grouting, and is poured into the moulds vertically. These moulds consist of an inner core and outside cover. In the case of large contracts the pipes are made on the job, the mixing plant being moved on rails from pipe to pipe.

When a sufficient number have been made along the line of the main, the trench is excavated at the beginning, the pipes laid and jointed, and the ground filled in as in the case of iron or steel pipes. By this means carting and carriage is saved, but in any case the cost of these pipes is less than those of iron or steel. Each pipe is constructed with rabbeted ends and the jointing is effected by grouting with a composition of bitumen run into the rabbeted edges. Reinforced concrete rings which have previously been placed loosely on the pipes are then adjusted all round the joints, pointed at the sides and covered in with cement. Joints thus made have been found to be absolutely perfect and safe for the highest pressures. The remarkable way in which concrete preserves iron from corrosion is well known, but it is surprising with the small thickness of these pipes that when cut after being some years in use the sheet steel and the bars are found to present the bluish

appearance of steel when leaving the rolling mills, although when originally put in they were slightly rusty. This fact is testified by eminent engineers in official positions abroad. "Bonna" pipes were first used by the Municipality of Paris about twelve years ago, since when about 250 miles have been installed both for high-pressure water and sewage. They vary in diameter from 1ft. to 12ft., and as nearly all the water and sewage pipes in Paris are laid in galleries there has been no difficulty in watching and taking careful note of their lasting qualities. By arrangement with the Columbian Fireproofing Co., British engineers visiting Paris may view these galleries, in one of which two high-pressure water mains, each 5ft. diameter, were laid side by side nine or ten years ago, one being of reinforced concrete and the other riveted steel plates. The concrete pipes have remained perfectly dry and sound, the cost of upkeep having been nil, whilst to prevent leakage the steel pipes need to be constantly watched and painted.

Obituary.

Mr. T. E. Knightley, F.R.I.B.A., of London, died recently at Eastbourne, in his eighty-second year. He was formerly district surveyor for Hammersmith. His best-known architectural works are the Queen's Hall, in Langham Place, and the Birkbeck Bank premises on Holborn. Mr. Knightley became a Fellow of the Institute in 1860.

Mr. J. K. Collins died recently, aged 90. He was the architect of several churches, schools and houses, and was elected a Fellow of the Institute in 1860, but resigned some years ago. He was the author of several folios illustrating Gothic ornament and was one of the early members of the Architectural Association, having been honorary secretary in 1850-1.

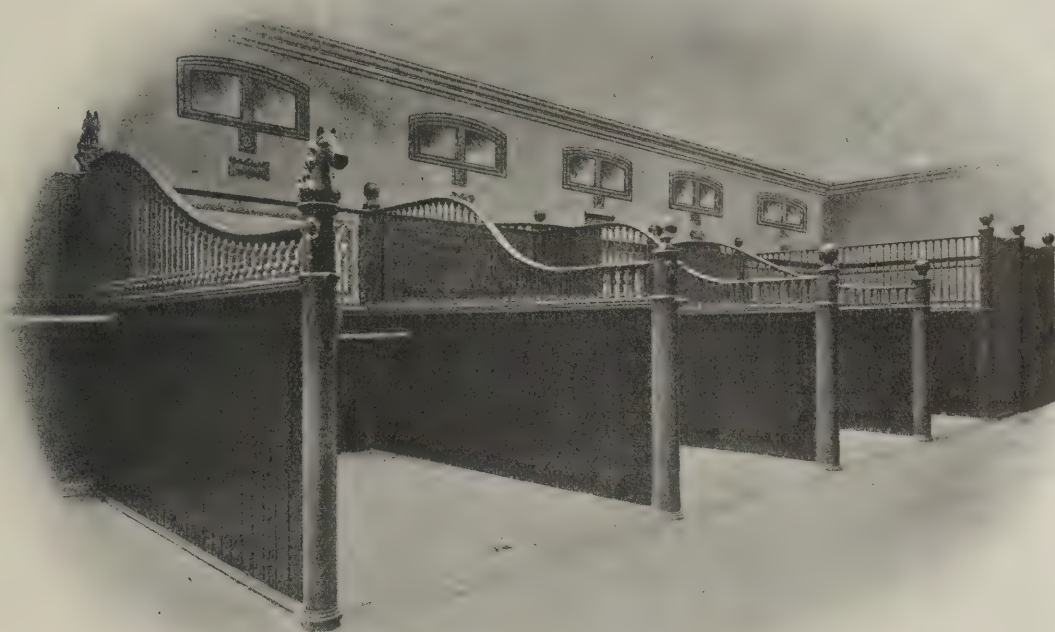
Mr. Joseph Howe, head of Messrs. Joseph Howe & Co., builders and contractors, of West Hartlepool, died recently after a long illness. Among works recently completed or in course of erection by the firm are the East Sussex County Asylum, at Hellingly, Sussex, £245,000 (architects, Messrs. G. T. Hine & Co.); the New Bridge Street Goods Station at Newcastle-on-Tyne, in ferro-concrete, £80,000 (architect, Mr. William Bell, F.R.I.B.A.); the new County Hall at Northallerton, £25,000 (architect, Mr. Walter H. Brierley); the Empire Palace Theatre at Newcastle, £20,000 (architect, Mr. Frank Matcham); and Bolton Hall, Wensleydale, £15,000 (architect, Mr. C. Hodgson Fowler). The business of the firm will be carried on by the executors with the same staff and under the same style as hitherto.

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHICH FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:				
Sept. 14	14	Chelmsford—Classrooms	Governors	C. & W. H. Pertwee, Bank Chambers, Chelmsford.
" 14	14	Middlecote—Cottage	Education Committee	Cook & Birmingham, Bampton Street, Tiverton.
" 14	14	Messingham—School	Victoria Building Club	Scorer & Gamble, Architects, Bank Street Chambers, Lincoln.
" 15	15	Rhymney—Houses	Managers	J. Llewellyn Smith & Davies, Architects, Aberdare.
" 15	15	Norton's Cross—Additions to Schools... ..	Asylum Committee	A. Swash, Architect, Midland Bank Chambers, Newport.
" 15	15	Canterbury—Alterations at Asylum	Rev. Canon Stuart	W. J. Jennings, Architect, 4 St. Margaret's Street, Canterbury.
" 15	15	Roscrea, Ireland—Repairs to Church	Education Committee	Ashlin & Coleman, Architects, Dawson Street, Dublin.
" 15	15	Marsham—Alterations to School... ..	Education Committee	A. J. Lacey, Architect, 6 Upper King Street, Norwich.
" 16	16	Hayscastle—Additions to School... ..	E. J. Percy	D. E. Thomas, 17 Victoria Place, Haverfordwest.
" 16	16	Brayton—Houses	W. Chiesman	J. H. Martindale, Architect, Eaglesfield Abbey Rooms, Castle Street, Carlisle.
" 16	16	Croydon—Business Premises	Gas Committee	W. C. Poole, Architect, Prested Road, Clapham Junction.
" 16	16	Manchester—Boiler-house... ..	Education Committee	C. Nickson, Gas Department, Town Hall, Manchester.
" 16	16	St. Dennis—School	J. Simmons	B. C. Andrew, Architect, Biddick's Court, St. Austell.
" 16	16	Redruth—Villa	Urban District Council	H. W. Collins, Architect, Clinton Road, Redruth.
" 16	16	Wallasey—Schools	Education Committee	J. Holt, Architect, 9 Albert Square, Manchester.
" 16	16	St. Dogmael's—Additions to School	Committee	D. E. Thomas, Architect, 17 Victoria Place, Haverfordwest.
" 16	16	Limavady—Temperance Hall	Guardians	D. Conroy, Architect, 21 Shipquay Street, Londonderry.
" 18	18	Stockport—Union Offices	Education Committee	C. F. Johnson, Clerk, Union Offices, Stockport.
" 18	18	Worthing—School	Guardians	Borough Education Department, Worthing.
" 18	18	Birmingham—Additions to Nurses' Home	Guardians	W. H. Ward, Architect, Paradise Street, Birmingham.
" 18	18	Embsay—Residence... ..	Education Committee	J. Hartley, Architect, Skipton.
" 18	18	London, S.E.—Relief Station	Guardians	H. Berney, Architect, 104 George Street, Croydon.
" 18	18	New Tredegar—Repairs to Schools	Education Committee	D. Morgan, Architect, Charles Street Chambers, Cardiff.



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Electrical Notes.

School Lighting.

It has already been pointed out in these columns how necessary it is to obtain the best possible system of lighting in schools, by reason of the fact that so much danger to eyesight is caused by insufficient lighting. Of course for the most part of the time when lessons are being conducted the windows admit all the necessary light, but on dark days, especially in winter, the employment of a suitable form of artificial light becomes necessary. In this connection the experiments recently made by Dr. Müller at Bremen, Germany, on the best method of arranging lights for students' desks are interesting. Two series of tests were made, the first with "Tantalum" electric glow lamps, and the second series with arc lamps. The glow lamps were arranged in four groups of six 22-c.p. lamps under a mirror reflector, and their positions were determined by dividing the room, which was about 25ft. by 23ft. by 13ft. high, into four equal rectangles and then suspending the lamps from the centres of each. The lamps had ground-glass globes. Dr. Müller concluded from these experiments that lighting under such conditions, with the lamps about 8ft. above the level of the desks, was sufficient for the size of the room in question, even making allowance for the gradual soiling of the walls and ceiling and the lessening illuminating value of the lamps themselves. The room in which the second series of tests with electric arc lamps was carried out measured 34ft. by 24ft. The lamps were of the Siemens-Schuckert school type, requiring 10.4 amperes and absorbing 1,144 watts, and they reflected the light up on to the ceiling and some little way down the walls. Two lamps were suspended about 8ft. from either end of the

walls. The light values obtained ranged from 4.7 to 2.5 candle feet, as compared with 3.8 to 2.7 of the glow lamps; but it should be borne in mind that the reflected light from the arc lamps was better than the direct light from the glow lamps, being more evenly diffused. The power used in both experiments was about the same. An interesting fact elicited was the difference in illumination when the rooms were empty and when occupied with desks and scholars. With the glow lamps the values were 4.1 candle-feet in the first case and 2.85 in the second case—a loss of about 30 per cent.; while with the arc lamps the values obtained by the tests were 3 and 2 respectively—a loss of about 33 per cent.

Too Many Electricians.

For the past half-century it has been common enough to hear of the overcrowded state of every profession, with, however, the salving statement that there is always room for the best men at the top. In the architectural profession the same story is told, and even the comparatively new profession of electrical engineering is similarly branded. The "Electrical Review" takes up this matter in its issue for September 8th. Our contemporary points out that technical colleges all over the country are turning out embryo electrical engineers by the thousand every year. A large part of the students' time has been given to the study of dynamo design, although the chances are that very few indeed will ever need to remember a single formula they learnt, and fewer still could design a satisfactory dynamo for any given output. It does not seem to be recognized yet that real dynamo designers form a very small proportion of the total number of electrical engineers; and now that sizes of motors and dynamos are fairly standardized the proportion will be smaller still in future.

Again, a technical graduate would, without any hesitation, undertake to design an electrical railway system complete from the power-house to the cars, yet he would fail if told to get out an arrangement for driving a pump or a machine tool by motor. "It is said, and truly said, that you cannot teach a man experience. But it is equally true that an engineer with a long experience in the practice of his profession will prove a more valuable and more helpful teacher to engineering students than one whose experience does not extend beyond the four walls of the college laboratory. This fact is well recognized in America, where professors are chosen for their practical experience as much as for their academic careers. Even, however, if our technical college training were perfect, it appears to be the fact that the supply of electrical engineers has overtaken the demand, and they are now a glut on the market. An advertisement for an experienced man, at a salary far too low for the experience demanded, will call forth replies from scores, even hundreds, of men with excellent credentials, prepared to go to the ends of the earth in order to earn a bare living. It is difficult to suggest a remedy for this state of things. It is not as though electrical engineering were the only overcrowded profession; all branches of engineering are in the same case, as are also the medical and legal professions. The supply of technically-trained men now far exceeds the demand, and the salaries obtainable for responsible positions are very often far less than those of the workmen occupying subordinate positions."

Mr. A. V. Ingall, of 3, Temple Row West, Birmingham, has taken Mr. E. Stanley Mitton into partnership. The business will now be carried on under the title of "Ingall, Son & Mitton."

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Complete List of Contracts Open.—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING—cont.			
Sept. 19	Seaton—Alterations to Church	—	Scott & Co., Architects, Victoria Building, Workington.
" 19	Sheffield—Alteration to County Court	—	H.M. Office of Works, Storey's Gate, London, S.W.
" 19	Birmingham—School	Education Committee	J. A. Palmer, Secretary, Education Dept., Edmund St., Birmingham.
" 20	Aylesbury—Schools	Education Committee	Clerks of Works Department, Education Office, Aylesbury.
" 20	Withington—Pavilions	Guardians	Clegg & Son, Architects, 104 King Street, Manchester.
" 21	Richmond—School	Town Council	F. B. Senior, Town Clerk, Richmond.
" 21	Langtoft—Alterations to School	Education Committee	Building Surveyor, Beverley.
" 23	Edinburgh—School	School Board	M. Carfrae, Architect, 3 Queen Street, Edinburgh.
" 23	Wrexham—Library	Town Council	V. Hodge, Architect, 13 Grand Parade, Teddington.
" 23	Barnstable—School	Education Committee	G. W. F. Brown, The Square, Barnstable.
" 23	Carmarthen—Repairs to Shire Hall	County Council	C. H. Mounsey, County Surveyor, Carmarthen.
" 23	Haverfordwest—Underpinning, &c.	—	W. D. Caroe, Architect, 8A Whitehall Place, London.
" 23	Bagnet—Church House	Trustees	E. Dolton, 35 Wood Street, Barnet.
" 25	Folkestone—Convenience	Corporation	Borough Engineer, Corporation Offices, Folkestone.
" 26	Birmingham—Tramway Depot	Corporation	G. Kenrick, Surveyor, 83 Colmore Row, Birmingham.
" 26	Ilford—School	Urban District Council	C. J. Dawson, Architect, 11 Cranbrook Road, Ilford.
" 26	Somersham, Ipswich—School Enlargement	Education Committee	G. W. Leighton, Architect, Princes Street, Ipswich.
" 27	Hendon—Lavatories	Guardians	Union Offices, Edgware.
" 26	Henley, Ipswich—House	Education Committee	G. W. Leighton, Architect, Princes Street, Ipswich.
" 26	London—Blocks of Buildings	County Council	Superintending Architect's Department, 15 Pall Mall East, S.W.
" 28	Halifax—Villas	—	G. Buckley & Sons, Architects, Tower Chambers, Halifax.
No date	Alltymynydd—Sanatorium	—	Architect, 4 Quay Street, Carmarthen.
ENGINEERING:			
Sept. 14	Leeds—Flushing Apparatus	Town Council	City Engineer's Office, Leeds.
" 14	Warrington—Saturator	Corporation	W. S. Haddock, Engineer, Corporation Offices, Warrington.
" 15	Alicante, Spain—Harbour Works	Harbour Board	Harbour Board, Alicante.
" 15	Christiania—Bridge	Norwegian State Railways Corporation	Statsbanernes Hovedkasserer, Jernbanetorvet No. 1, Christiania.
" 16	Heywood—Bacterial Filters	—	J. Diggle, C.E., Hind Hill Street, Heywood.
" 18	Portsmouth—Machinery	Education Committee	A. H. Bone, Cambridge Junction, Portsmouth.
" 18	Linlithgow—Electric Lighting Plant	Committee	A. Lindsay, 11 Jamaica Street, Glasgow.
" 18	Bristol—Reconstruction of Shed	Docks Committee	W. W. Squire, Engineer, Cumberland Basin, Bristol.
" 18	Watford—Steel Chimney	Urban District Council	W. H. F. Colebrook, Electrical Engineer, Watford.
" 18	Wimbledon—Motors, &c.	Borough Council	C. H. Cooper, Engineer, Council Offices, Wimbledon.
" 19	Colwyn Bay—Water-supply Works	Urban District Council	W. Jones, Engineer and Surveyor, Colwyn Bay.
" 19	Bishop's Stortford—Boiler	Urban District Council	T. Swatheridge, Clerk, 7 North Street, Bishop's Stortford.
" 20	Amsterdam—Bridge Superstructures	—	M. Mart. Nijhoff, Bookseller, The Hague.
" 20	Immingham—Dock	Directors	Sir J. Wolfe Barry & Partner, 21 Delahay Street, Westminster, S.W.
" 25	Sewree, Bombay—Pier	Bombay Port Trustees	Sir J. Wolfe Barry, 7 The Sanctuary, Westminster, S.W.
" 25	Bamford—Filters, &c.	Water Board	E. Sandeman, Engineer, Bamford, near Sheffield.
" 26	Upton-on-Severn—Wall	Rural District Council	Willcox & Raikes, 63 Temple Row, Birmingham.
" 26	Bridgwater—Doors	Drainage Board	W. J. R. Poole, Clerk, 9 Dampier Street, Bridgwater.
" 28	Tula, Roumania—Water-supply	Municipality	Municipal Offices, Tula.
Oct. 2	Westerham—Pumping-engine	Metropolitan Water Board	District Engineer, Brookmill Road, Deptford, S.E.
" 9	Liege—Extension of Water Conduit	—	A. Halleux, C.E., 74 rue Fabry, Liege.
" 10	London—Reconstruction of Bridges	County Council	M. Fitzmaurice, Chief Engineer, County Hall, Spring Gardens, S.W.
" 10	Alexandria, Egypt—Quays	—	Director-General of Harbours and Lighthouses, Alexandria.
" 23	Mussoorie, India—Electric Lighting and Waterworks Scheme	Municipality	C. H. Shanan, Municipal Office, Mussoorie, India.
Nov. 9	Havana—Pier	—	Cuban, Consulate London.
IRON AND STEEL:			
Sept. 14	Salford—Pipes	Water Committee	L. C. Evans, Town Clerk, Town Hall, Salford.
" 16	Island of Barra—Pipes, &c.	—	J. Wedderspoon, Engineer, The Castle, Inverness.
Oct. 9	Mussoorie, India—Pipes, &c.	Municipal Board	C. H. Shanan, Municipal Office, Mussoorie.
No date	Rochford—Water-mains	Rural District Council	H. T. Sidwell, Engineer, Rochford, Essex.
PAINTING AND PLUMBING:			
Sept. 14	Uxbridge—Painting Workhouse	Guardians	W. L. Eves, Surveyor, 54 High Street, Uxbridge.
" 14	Fulham—Redecorating Children's Homes	Guardians	E. J. Mott, Clerk, Guardians' Offices, Fulham Palace Road, W.
" 15	Canterbury—Painting Asylum	Asylum Committee	W. J. Jennings, Architect, 4 St. Margaret's Street, Canterbury.
" 18	Canterbury—Painting at Electricity Works	Electric Light Committee	A. L. Turley, City Surveyor, Canterbury.
ROADS AND CARTAGE:			
Sept. 15	Elham—Asphalting Playground	Guardians	E. Loneragan, Clerk, 11 Cheriton Place, Folkestone.
" 15	Llandudno—Street Extension Works	Urban District Council	E. P. Stephenson, Engineer and Surveyor, Town Hall, Llandudno.
" 16	Haverfordwest—Paving Flags	Town Council	J. Gibbon, Borough Surveyor, Haverfordwest.
" 16	Harrow-on-the-Hill—Granite	Urban District Council	J. Percy Bennetts, Surveyor to the Council, Harrow.
" 16	Devonport—Cartage	Town Council	Surveyor's Offices, Ker Street, Devonport.
" 18	Stretford—Granite Paving	Urban District Council	Surveyor, Stretford, Council Offices, Old Trafford.
" 18	Stevenage—Road	Urban District Council	Council Offices, Orchard Road, Stevenage.
" 18	Camberwell—Making-up	Borough Council	W. Oxtoby, Borough Engineer, Town Hall, Peckham Road, S.E.
" 19	London, W.—Making-up	Acton District Council	D. J. Ebbetts, Surveyor, 57 High Street, Acton, W.
" 19	Edmonton—Broken Granite	Urban District Council	G. Eedes Eachus, Engineer, Town Hall, Edmonton.
" 20	Hertford—Metalling, &c.	T. C. Usher & C. T. Barclay	Norris & Duvall, 60 Fore Street, Hertford.
" 21	Rugby—Highway Repairs, &c.	Rural District Council	T. W. Willard, Surveyor, Rugby.
" 23	Paddington—Granite Chippings	Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington.
" 25	Bishop's Stortford—Gravel	Urban District Council	Surveyor to the Council, Bishop's Stortford.
" 25	Bishop's Stortford—Materials	Urban District Council	T. Swatheridge, Clerk, Council Offices, Bishop's Stortford.
" 26	Hanwell—Broken Granite	Urban District Council	Urban District Council Offices, Hanwell, W.
Oct. 4	Wanstead—Making-up	Urban District Council	Council Offices, Wanstead, N.E.
SANITARY:			
Sept. 14	Stoke Gabriel—Drain	Rural District Council	Mr. Luscombe, Yards Farm, Stoke Gabriel.
" 16	Consett—Sewage-disposal Works	Urban District Council	W. S. Shell, Engineer, Parliament Street, Consett.
" 18	Wigan—Scavenging	Rural District Council	H. Ackley, 9 Victoria Buildings, King Street, Wigan.
" 18	Hollingbourne—Sewerage Works	Guardians	Fairbank & Son, Civil Engineer, Lendal Chambers, York.
" 19	Hertford—Drains	Corporation	Borough Surveyor, Hertford.
" 20	Hull—Diversion of Drain	Dock Committee	T. M. Newell and R. Pawley, Engineers, Dock Office, Hull.
" 20	Newburg—Drainage Works	Town Council	Sang & Lockhart, Civil Engineer, Kirkcaldy, Scotland.
" 21	Camberley—Sewerage and Sewage-disposal Works	Urban District Council	Willcox & Raikes, 63 Temple Row, Birmingham.
" 23	Dorking—Sewerage Works	Urban District Council	G. R. Strachan, 9 Victoria Street, Westminster, S.W.
TIMBER:			
Sept. 14	Herne Bay—Timber	Urban District Council	F. W. J. Palmer, Surveyor, Town Hall, Herne Bay.
" 25	London, E.C.—Telegraph Poles	General Post Office	S. C. Hooley, Stores Dept., G.P.O., 17 & 19 Bedford St., London, W.C.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Sept. 23	Cheshunt—Library	—	£1 is.	A. Collingwood Lee, Manor House, Cheshunt.
Oct. 9	London—Shop Fronts	£75	—	W. H. Smith & Sons, 186 Strand, W.C.
" 16	Preston—School	£50, £30 and £20	—	Director of Education, Education Offices, Preston.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

Advertising Notes.

A standing advertisement, like a standing pool, loses all life, and soon gathers the scum of obscurity. Change your copy frequently.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT and SURVEYOR'S ASSISTANT, with 10½ years' experience in design, details, specification, and quantities for first-class work, just disengaged, desires RE-ENGAGEMENT.—Z. 6, Hope Terrace, Matlock Bath, Derbyshire. 1368

ARCHITECT'S ASSISTANT (A.R.I.B.A.) desires immediate RE-ENGAGEMENT in Provinces. Large varied experience good class Provincial work. Design, details and experienced Quantity Surveyor. Excellent testimonials. Very moderate salary.—"EXPERIENCE," Box 1325, BUILDERS' JOURNAL Office, 6 Great New Street, Fetter Lane, E.C. 1368

ARCHITECT'S ASSISTANT, capable, energetic, eight years' experience, seeks re-engagement. Town or country. Salary £2 2s.—LASCELLES, 5, Dovecote Road, Wandsworth Common. 1302

ARCHITECT'S ASSISTANT (25) disengaged; nine years' experience; good draughtsman, working drawings, details, &c.; London or country.—W. A. N., 46, St. Augustine's Road, Camden Square, N.W. 1372

ARCHITECT'S ASSISTANT (24) disengaged; nine years' experience; good draughtsman, designs, working drawings, details, &c.; London or country.—W. H. L., 83, Elspeth Road, Clapham Common, S.W. 1374

ARCHITECT'S JUNIOR ASSISTANT (21) desires SITUATION, free after 23rd September. Four years' experience. Advanced building construction certificate. Moderate salary.—C. E. H., 263, Broad Street, Birmingham. 1341

ARCHITECTURAL ASSISTANT disengaged. Preliminary sketches, working drawings, specifications, details, surveying, and levelling, and general office routine. Salary £2.—Box 1332, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1342

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT in a good London office. Five years' experience; age 23. Good references. Salary moderate.—B. E. ATKINSON, Jun., 14, Rosslyn Hill, Hampstead, N.W. 1342

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BUILDER'S ASSISTANT requires ENGAGEMENT. Ten years' experience; take charge of office; thoroughly conversant whole routine; take off quantities; draughtsman, adjustment of contracts; excellent references.—B., St. Albans, Winchester Road, Basingstoke. 1329

BRICKLAYER WANTS WORK. Practical in sanitary, fire and general work. Can take charge.—W. VENN, 68, Netherwood Road, West Kensington Park. 1331

BUILDER'S CLERK.—Book-keeping, assisting Quantity Surveyor; abstracts, time-sheets, general routine; typewriter; excellent references.—P. H. G., 2, "Fernhelo," Bonner Hill Road, Kingston-on-Thames. 1352

BUILDER'S CLERK, experienced, double entry book-keeping, time sheets, correspondence and general routine. Plans &c. Town or country. Moderate salary.—E. W. H., 11, Archibald Road, Tufnell Park, N. 1348

CARPENTER, JOINER, STAIRHAND; piece or day, or as Working Foreman.—J. E. PLASTERER, clean workman; piece or day; abstainers; town or country.—A. E., 84, Cambourne Road, Southfield, Wandsworth. 1320

CLERK of WORKS or GENERAL FOREMAN disengaged; practical and reliable; experienced in all classes of public and private works; good references; town or country.—C. W., 53, Portland Road, Notting Hill. 1304

ESTATE OFFICES, ARCHITECTS, SURVEYORS.—Young Gentleman well up in Planning, Surveying, Levelling, Quantities, and Specifications, desires permanency. Experienced in General Management and Estate Development. A.I.S.E. and A.R.S.I.—Box 1311, BUILDERS' JOURNAL Office, Gt. New St., E.C. 1311

FOREMAN of JOINERS seeks situation with a firm which turns out first-class work. Accurate setter out. Good references.—Chaseley Villa, Langton Road, E. Molesey. 1313

GENERAL or WORKING FOREMAN (Carpenter) seeks SITUATION. References. Age 29. Gold and silver medals Carpenters' Comp., first-class certificate and bronze medal Carpenters' Comp. Exam.—W. S., 43, Skinner Street, Clerkenwell. 1305

GENTLEMAN with considerable commercial experience desires ENGAGEMENT on Staff of Merchant or Manufacturer. Fully qualified for position of confidence and responsibility, secretarial duties, or charge of a London office.—L.F.S.H., BUILDERS' JOURNAL, 6, Great New Street, Fetter Lane, E.C. 1322

JUNIOR DRAUGHTSMAN (21) desires ENGAGEMENT. Working drawings, details, good tracer, colourist, &c. Five years' experience, general office routine. Moderate salary.—K., 7, Cornfield Terrace, Eastbourne. 1354

MACHINIST.—Band and circular sawyer; sharpens saws, planing machines, fourcutter; some experience in French spindle; could take charge of small plant; town, country, or would go abroad.—MACHINIST, 51, Somers Road, Walthamstow. 1344

MACHINIST, young, seeks situation on Sawbench or Planer; good refs.; wages mod. London or district.—A. A., Brooklyn House, Bell Lane, Hendon, N.W. 1365

MACHINIST wants JOB, can work Tenon, Mortice, and Planing Machines, Rise and Fall, and Saw Benches; good cutter out of Joiners' work; good references. Town or country.—G. L., 30, Cottis brooke Street, Woodpecker Road, New Cross, S.E. 1317

MASON FOREMAN seeks RE-ENGAGEMENT; quick setter out; good manager; 15 years' experience; first-class references.—Box 1309, BUILDERS' JOURNAL Office, 6, Great New Street, E.C. 1309

OUTSIDE GENERAL or WORKING FOREMAN seeks SITUATION with Builder; carpenter and joiner by trade; well up in all branches; good references.—POWELL, 15, Walters Road, South Norwood. 1319

PLUMBER (R.P.).—Gas and Hot Water Fitter, first-class all-round hand, wants work day or piece.—C., 4, Blake Terrace, Lynton Road, Gravesend. 1307

PLUMBER, GAS AND HOT WATER, seeks Situation. Well up in Jobbing and Estate Work. Able to take charge; can fill up time Painting. Abstainer.—M. M., 167, Griffin Road, Plumstead. 1327

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SURVEYOR'S JUNIOR ASSISTANT, 22, requires post in Borough Surveyor's office; holding public appointment, has served 3 years' articles with Borough Surveyor. Country town preferred.—E. BURMAN, Ramsbury, Wilts. 1349

SHOP FOREMAN of JOINERS seeks RE-ENGAGEMENT. Capable, energetic, quick, and accurate setter out. Good manager of men. Accustomed to first-class joinery works. London or provinces.—W. H. T., 15, Barlow Street, Walworth, S.E. 1355

TO QUANTITY SURVEYORS.—JUNIOR ASSISTANT requires Engagement; abstracting and billing.—Box 1323, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1323

WANTED appointment in office by young Junior ARCHITECT and SURVEYOR; age 23; good experience; excellent references. Sal. £1 to 25s. per week.—Box 1364, BUILDERS' JOURNAL Office, 6, Great New Street, E.C. 1364

WANTED by young man (32), MANAGEMENT of ESTATE, 14 years' varied experience; excellent references; moderate salary for permanency, or would act as builder in development of an estate.—Box 1324, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1324

WANTED by Practical Man, Brickwork and Pointing to any amount; first-class work guaranteed at reasonable price, or would take charge as working foreman, town or country; good refs., abstainer.—A. S., 1, White Hart Lane, Barnes, S.W. 1350

YOUNG ARCHITECT just starting for himself is able to assist others.—G. W. M., 12, Muswell Road, Muswell Hill, N. 1353

YOUTH requires Situation with good firm of Builders and Contractors, in Liverpool or Manchester district, well educated and used to general routine of business. Mod. sal.—Box 1363, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C. 1363

Appointments Vacant.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

CARVERS (Soft Stone).—WANTED GOTHIC HAND.—M. WHITE, Carver, Peterborough.

ESTIMATING and QUANTITIES.—Correspondence Classes in above (carefully revised to date) by an experienced Surveyor, specially adapted to suit the requirements of Builders' Clerks, Foremen, Leading Hands, and others. For terms and full particulars, write "Classes, Box 1," WILLING'S, 162, Piccadilly, London, W.

STAINED GLASS, LEADED LIGHTS.—Wanted Designer to prepare up-to-date designs occasionally, at home, for competitions, &c., for Midland town.—Box 1362, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

WANTED Designer for Stained Glass and Leaded Lights.—Address Box 1367, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

Drawings, Tracings &c.

DESIGNS for SUBURBAN RESIDENCES prepared to suit clients. Plans and Specifications for new work and alterations. Drain. Plans at specially low fees.—J. LAWRENCE, jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W.

DRAWINGS from rough sketches, designs, details, specifications, drain plans and quantities PREPARED; terms moderate.—J. W., 8, Rylett Crescent, Shepherd's Bush, W. 1373

EXPERT DRAUGHTSMAN with own office undertakes perspectives, designs, and general architectural work. Moderate charges.—ARCHITECT, 754, Fulham Road, S.W. 1343

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HOSPITALS and SCHOOLS.—EXPERT ASSISTANCE offered on designs. Highly successful in competitions. Moderate speculative terms.—G. B., "Woodlands," Ryde, I.W. 1318

PHOTO PRINTS.—Drawings, Tracings, Perspectives, &c., prepared for Architects in any part of the country; moderate charges; samples on application.—Box 1351, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

QUANTITY SURVEYOR.—Quantities prepared, variations measured, &c., by experienced quantity surveyor. Terms by arrangement.—Box 1315, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT and SURVEYOR'S BUSINESS for DISPOSAL; efficiently fitted and splendidly situated on main thoroughfare of London suburb; would suit young architect.—Box 1345, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

Miscellaneous.

"GRANDMASTER".—Grove Flanged Draught Chimney Pot. The Noiseless and most efficient Snake Conductor.—PARKINSON, Greenhill Road, Armley, Leeds.

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MANTELPieces.—To clear Surplus Stock, a few cheap.—Apply 12, New Oxford Street, London, W.C.

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YOUNG ARCHITECT wishes to join another or artist, to share apartments, near City.—Particulars and lowest terms to Box 1316, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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Telephone, No. 1011 HOLBORN. Manager—JOHN B. THORP. Telegrams: "DIVIDITORE," LONDON.

Educational.

R.I.B.A., SOCIETY OF ARCHITECTS AND CIVIL SERVICE TECHNICAL EXAMINATIONS, preparation by correspondence or residence. 29 first places.—G. A. T. MIDDLETON, 19, Craven Street, Strand.

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating.—For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

R.I.B.A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for Syllabus to Mr. A. G. BOND, B.A., Oxon., A.R.I.B.A., 115, Gower Street, London, W.C. (late Howgate and Bond).

PRACTICAL DESIGNING OF STEEL CONSTRUCTIONAL WORK taught by Correspondence, individually or in classes. Elementary and advanced courses arranged for Architects, Engineers, &c. Write for particulars to the EMBANKMENT ENGINEERING INSTITUTE, 156, Temple Chambers, Temple Avenue, E.C.

STRUCTURAL STEELWORK

Can you Design Steelwork easily and readily? We can teach you privately by our system of Science Correspondence Tuition. Send for free Booklet J., and read what we have done for others and what the Technical Press says about our methods.

MIDLAND ENGINEERING BUREAU, STRAND, DERBY.

UNIVERSITY COLLEGE, LONDON.

SCHOOL OF ARCHITECTURE.
Professor: F. M. SIMPSON, F.R.I.B.A.

DAY CLASSES.

The Day Classes provide a thorough preparatory training for Students wishing to enter the Architectural Profession. Students obtaining a First Class Diploma or Certificate are exempted from the Intermediate Examination of the R.I.B.A.

EVENING CLASSES.

(Held under a special grant from the Carpenters' Company).

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Special Visitors: REGINALD BLONFIELD, A.R.A., M.A., and LEONARD STOKES, F.R.I.B.A., on WEDNESDAYS at 6.45, beginning OCTOBER 11th.

BUILDING CONSTRUCTION AND ELEMENTARY DESIGN CLASS.

On THURSDAY at 6.45, beginning OCTOBER 5th.

QUANTITY SURVEYING CLASSES.

On WEDNESDAYS at 6.30, beginning OCTOBER 4th, and on FRIDAYS at 6.30, beginning OCTOBER 6th. For particulars of both Day and Evening Classes apply to the undersigned.

W. W. SETON,
Secretary.

KING'S COLLEGE, LONDON.

COURSE of TRAINING for SANITARY INSPECTORS in BUILDING CONSTRUCTION, Chemistry and Physics of Hygiene and General Duties of Sanitary Inspectors, will commence OCTOBER 4th. Apply SECRETARY, King's College, London.

THE ARCHITECTURAL ASSOCIATION.

COURSES OF INSTRUCTION IN ARCHITECTURE.

The Day and Evening Continuation Schools will open on Monday, September 25th. Intending Pupils are requested to forward their names to the Secretary as soon as possible.

The Evening School also opens on the same date at 6.30 p.m.

A pamphlet containing full information as to the classes and advantages of membership may be obtained on application to the Secretary, 18, Tufton Street, Westminster, S.W.

HENRY TANNER, JR., } Hon. Secs.
A. MARYON WATSON, }

Property & Land Sales.

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The remaining FREEHOLD PROPERTIES of J. Shillitoe & Son, sold by order of the Trustees to wind up the Estate.

SALTER, SIMPSON, & SONS are instructed to SELL by AUCTION, at the ANGEL HOTEL, Bury St. Edmunds, on WEDNESDAY, SEPTEMBER 27th, 1905 at SEVEN o'clock, the extensive and well-arranged BUILDER'S PREMISES situate in College Lane, comprising dwelling house, large open yard, spacious joinery mill, saw mill sheds, joinery shops, engine room and workshop, glueing-up shop, turning shop and foreman's office, joiner's shop, two-storey drying store, drying room, paint store, &c. in one or two Lots.

Also
The well appointed FAMILY RESIDENCE, No. 20, Whiting Street; gardens, viney greenhouse, motor house, and cottage.

Four capital COTTAGES, Nos. 1 to 4, College Terrace, let, producing £57 s. per annum.

Small RESIDENCE No. 19, Whiting Street; also FREEHOLD PASTURE LAND of 15 acres.

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TO BUILDERS.

CONVALESCENT HOME, HUNSTANTON, NORFOLK.

TENDERS are invited for the erection and completion of a NEW BUILDING FOR CHILDREN.

Copies of bills of quantities may be had on application to the Architect, A. PAUL MACALISTER, F.R.I.B.A., 20, St. Andrew's Street, Cambridge, accompanied by a deposit of £2 2s., which will be returned on receipt of a bona fide tender.

The Committee do not bind themselves to accept the lowest or any Tender, and the Contractor may be required to find sureties for the due performance of the contract.

Tenders to be delivered in the envelopes provided to the Hon. Solicitors, Messrs. BELOE & BELOE, King's Lynn, on or before MONDAY, SEPT. 25th, at 12 noon.

Plans may be seen at the Home, or at the Architect's Office, or at our Offices, between the hours of 10 a.m. and 4 p.m.

BELOE & BELOE.

ELHAM UNION.

ASPHALTING PLAYGROUND, &c.

The Guardians invite TENDERS for properly REPAIRING the YARDS, PLAYGROUNDS, PATHS, &c., at the Cottage Homes, Cheriton, with reliable asphalt or other hard and durable material.

Persons tendering to specify how it is proposed to do the work, giving detailed quantities, with quality and description of the material proposed to be used, including any edging, kerbing, channelling, and levelling, &c., that may be necessary, the price to include all labour and materials, and the work to be completed to the satisfaction of the Guardians' Building Committee.

Tenders to be delivered at my office, as under, before the 15th SEPTEMBER.

R. LONERGAN,
11, Cheriton Place,
Folkestone,
18th August, 1905. Clerk.

EMPLOYMENT REGISTER.

Too late for Classification.

- 1363.—YOUTH, well educated, used to routine of builders' business, wants berth with builder or contractor in Liverpool or Manchester.
- 1364.—ARCHITECT'S JUNIOR ASSISTANT AND SURVEYOR (23), good exp.; ex. refs.; s. 20s. to 25s.
- 1365.—MACHINIST, young; sawbench or planer. Good ref.s.; mod. s.; London or district.
- 1366.—ARCHITECT'S JUNIOR ASSISTANT. 6 yrs. exp., article 5 yrs.; contract drawings, details, surveying and levelling; ex. refs.
- 1368.—ARCHITECT AND SURVEYOR'S ASSISTANT; 10½ yrs. exp. Designs, details, specifications, and quantities. First-class work.
- 1372.—ARCHITECT'S ASSISTANT (25); 9 yrs. exp.; good draughtsman, working drawings, details. London or country.
- 1373.—DRAWINGS, designs, details, drain plans, specifications or quantities prepared. Terms mod.
- 1374.—ARCHITECT'S ASSISTANT (24); 9 yrs. exp.; good draughtsman, designs, working drawings, details. London or country.

See p. xx for the Employment Register.

Privileges open to all Regular Readers of the "Builders' Journal."

I.—Free Monthly Advertisements.

1. A Free Advertisement of 12 words in the Wanted or Miscellaneous Advertisement Columns, in one issue of the BUILDERS' JOURNAL during each calendar month will be given to any regular reader.

2. The charge of one penny will be made for each additional word.

3. Advertiser's Name and Address or Box Number must be counted, but will in no case be reckoned as more than five words.

4. All advertisements must be accompanied by the correct remittance, and should a receipt be required a stamped addressed envelope must be enclosed.

5. The Proprietors reserve to themselves the right of refusing any advertisement.

II.—Free Answers to Enquiries.

1. The services of a large staff of experts are at the disposal of all regular readers who require information on architectural, constructional or legal matters.

2. Questions should in all cases be addressed to the Editor, and be written on one side of the paper only.

3. Correspondents are particularly requested to be as brief as possible.

4. The querist's name and address must always be given, not necessarily for publication.

Note.—Owing to the large number of enquiries we receive weekly, we are compelled to restrict the advantages of this department to Regular Readers.

III.—Free Accident Insurance of £500.

1. Every regular reader of the BUILDERS' JOURNAL is entitled to the benefit of this Insurance.

2. A Pamphlet giving full details of this and other Insurance schemes inaugurated by the BUILDERS' JOURNAL for the benefit of its readers, and guaranteed by "The Ocean Accident Corporation, Limited," will be sent on application.

What is a Regular Reader?

We have employed the term "Regular Reader" throughout these announcements as the description "subscriber" is often understood to mean one who subscribes direct to the publishing office.

We mean by a Regular Reader anyone who has placed an order with us or any newsagent or bookstall for the BUILDERS' JOURNAL for one year.

Those readers who order the BUILDERS' JOURNAL through their local newsagent or bookstall should send us the newsagent's receipt. Their names will then be placed on our subscribers' list, and they will be entitled to all the advantages set out above.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.

OFFICE: 6, GREAT NEW STREET, FETTER LANE E.C.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barrow-in-Furness.—Accepted for the construction of a steel road bridge over the Walney Channel, uniting Barrow Island and Walney Island, for the Corporation:—

Sir William Arrol & Co., 85, Preston Street, Glasgow... £87,900

Enderby.—For the erection of a Council school, for the Leicestershire County Council. Messrs. Barrowcliff & Alcock, architects, Mill Street, Loughborough:—

Jeffs & Edwards... £3,990 0 0
Leicester Builders... 3,433 0 0
W. F. Harding... 3,370 0 0
R. Peach... 3,286 10 0
Haskard, Rudkin & Beck... 3,275 0 0
A. J. Wileman... 3,270 0 0
T. Herbert... 3,264 0 0
C. A. Dobson... 3,250 0 0
G. A. Phipps... 3,235 0 0
Langton & Son... 3,227 14 0
E. Orion... 3,224 0 0
J. H. Clayton... 3,220 0 0
W. Moss... 3,195 0 0
T. Barker & Son... 3,158 19 0
C. Wright... 3,149 0 0
W. Moss & Sons... 3,070 0 0
W. Corah & Son,* Loughborough... 2,992 0 0
* Accepted.

Farnham Common.—For the erection of a residence for Dr. H. Sydney. Mr. F. C. Moscorop Young, architect, 2, Lancaster Place, W.C. Quantities by Messrs. J. Waldrum & Son, 12, Buckingham Street, W.C.:—

Conservatory.
J. Wheeler... £2,650 0 0
J. H. R. Atkins... £72 11 0
W. Creed... 2,244 67 10 0
H. D. Bowyer... 2,043 62 10 0
F. W. Harris & Co.*... 1,900 59 0 0
1,882 59 0 0
* Accepted provisionally.

Guildford.—For the erection and completion of a house in London Road, for Mr. L. C. Biddle. Messrs. Clemence & Moon, architects, Guildford. Quantities by architects:—

Swayne & Son... £1,347
A. Johnson... 1,331
S. Ellis... 1,322
Tribe & Robinson... 1,315
E. & J. H. Holden,* Cranleigh... 1,298
* Accepted.

Guildford.—For rebuilding 189 and 190, High Street, for Mr. W. J. Lympson. Messrs. Clemence & Moon, architects, Guildford. Quantities by architects:—

F. Milton... £3,260
Tribe & Robinson... 3,225
Drowley & Co... 3,195
H. Brand... 3,123
A. Johnson,* Guildford... 3,093
* Accepted.

Godalming (Surrey).—For the erection of business premises in Bridge Street, for Godalming and District Co-operative Society. Mr. H. Moon, architect, 96, Street, Godalming. Quantities by architect:—

Mitchell Brothers... £2,250 0 0
J. W. Humphrey... 2,085 0 0
R. Smith... 2,036 0 4
Haslemere Builders... 1,990 0 0
Deacon & Son... 1,921 0 0
J. Lee... 1,947 0 0
Drowley & Co... 1,902 6 0
F. Milton... 1,899 0 0
Wallis & Bennett... 1,787 7 3
F. Raynsford... 1,750 0 0
D. Fry,* Godalming... 1,703 9 0
* Accepted.

Ratby.—For enlarging the Ratby Council School, together with out-offices, drainage, &c., for the Leicestershire County Council Education Committee. Messrs. Harding & Topott, architects, Hotel Street, Leicester:—

A. & W. Chambers... £1,964 13 0
G. Toone & Sons... 1,944 0 0
C. W. Mattock... 1,913 0 0
J. Marston & Son... 1,893 0 0
W. Smith... 1,841 3 0
Leicester Builders... 1,779 0 0
W. Moss... 1,765 0 0
E. Bax... 1,765 0 0
F. Sleath... 1,759 0 0
J. Cole... 1,728 0 0
D. Shipman,* Ratby... 1,699 4 0
* Accepted.

South Shields.—Accepted for the erection of car-sheds on vacant land in Dean Road, for the Town Council. Mr. S. E. Burgess, M.I.C.E., borough engineer and surveyor:—

J. L. Miller, Back Spring Terrace, North Shields... £9,325 9 0
[Twenty-seven tenders received.]

Wimbledon.—For the erection of ten small villas in Chatsworth Avenue, Kingston Road, for the Polytechnic Estate. Mr. W. C. Poole, architect, Prested Road, Clapham Junction, S.W.:—

Cropley Brothers, Epsom... £5,868 0 0
P. B. Evans & Co., Hyde Park, W... 5,171 0 0
A. G. Crisp, Walthamstow... 4,900 0 0
S. N. Soole, Richmond... 4,700 0 0
F. D. Hidden, Brentford... 4,562 0 0
G. W. Eyles, Clapton, N.E... 4,510 0 0
Batten Brothers, Reading... 4,470 0 0
J. Barker & Co., Kensington, W... 4,370 0 0
Jones Brothers, Tooting, S.W... 3,854 0 0
J. E. Saunders, Beckenham... 3,840 13 0
F. Kinnaird, Brixton, S.W... 3,794 0 0
G. Richardson, Earlsfield, S.W... 3,705 0 0
B. Mimmack, Wandsworth, S.W... 3,704 0 0
T. B. Hope, Putney, S.W... 3,660 0 0
T. B. Campion, Walthamstow... 3,641 0 0
F. W. Harris & Co., Barnsbury, N... 3,570 0 0
J. C. Russell, West Norwood... 3,510 0 0
C. Douglas, Lewisham... 3,427 10 0
H. Coombs & Sons, Merton... 3,420 0 0
W. Roberts, Croydon... 3,390 0 0
A. Ray, West Ealing... 3,300 0 0
Hall & Jacobs, Sydenham... 3,128 0 0
R. N. Marrable, Leytonstone... 3,067 0 0
H. E. H. Buckingham, Wimbledon Harbour & English,* Southend-on-Sea... 3,050 0 0
2,828 0 0
* Accepted.

NOTE.—One other tender for £3,245 received, but no name or address given.

Groby (Leics.).—For the erection of Council school, for the Leicestershire County Council Education Committee. Messrs. Barrowcliff & Alcock, architects, Mill Street, Loughborough:—

W. F. Harding... £1,800 0 0
C. A. Dobson... 1,767 0 0
J. C. Kellett & Son... 1,725 0 0

R. Peach... £1,721 0 0
A. J. Wileman... 1,720 0 0
Jeff & Edwards... 1,720 0 0
Leicester Builders... 1,690 0 0
Haskard, Rudkin & Beck... 1,665 0 0
B. Shipman... 1,663 8 0
C. Wright... 1,651 0 0
J. T. Ball... 1,650 0 0
G. Toone & Sons... 1,648 0 0
J. H. Clayton... 1,635 0 0
T. Barker & Son... 1,624 19 0
T. Herbert... 1,556 0 0
F. Sleath... 1,549 0 0
W. Corah & Son,* Loughborough... 1,519 0 0
* Accepted.

London, N.—For the erection of a new police section house at Islington. Mr. J. Dixon Butler, architect and surveyor to the Metropolitan Police, New Scotland Yard. Quantities by Messrs. Thurgood, Son & Chidgey, Charing Cross Chambers, Duke Street, Adelphi:—

Harris & Wardrop... £5,570
C. Ansell... 5,507
Lathey Brothers... 5,500
F. & H. F. Higgs... 5,484
Lascelles & Co... 5,462
Kilby & Gayford... 5,476
Mowlem & Co... 5,345
Prestige & Co... 5,270
Grover & Son... 5,268
Ashby & Horner... 5,239
Holloway Brothers... 5,218
Dearing & Son... 5,191
Lawrance & Sons... 4,984
Leslie & Co... 4,844

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending September 8th sixteen failures in the building and timber trades in England and Wales were gazetted.

J. ROWSELL, builder, South Petherton. Adj. Aug. 30th.

J. MOLLEKIN, builder, Hull. Adj. Aug. 28th.

E. W. SPENCER, architect, Malvern Link. P.E., Worcester Guildhall, Oct. 3rd, at 2.

F. THORNTON, slater and tiler, Croydon. R.O. Aug. 28th.

G. COLLINS, builder, Sutton Coldfield. First meeting, 191, Corporation Street, Birmingham, Sept. 14th, at 11.

P.E., Birmingham C.C., Oct. 23rd, at 2.

CAWSON & COALES, surveyors, Liverpool. First meeting, O.R.'s, Liverpool, Sept. 13th, at 11. P.E., Liverpool C.C., Oct. 19th, at 11.

J. WILSON, painter and decorator, Bradford. First meeting, O.R.'s, Bradford, Sept. 15th, at 3.30. P.E., Bradford C.C., Oct. 4th, at 10.

W. T. BOWEN, builder, Merthyr Tydfil. First meeting, 135, High Street, Merthyr Tydfil, Sept. 13th, at 12.

P.E., Merthyr Tydfil Townhall, Oct. 4th, at 3.

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ENFIELD TOWN LAND AND PROPERTY CO., LTD., builders and contractors. Capital: £5,000.

ENGLISH FREEHOLDS, LTD., builders, contractors, &c. Grosvenor Mansions, Victoria Street, S.W. Capital: £300,000.

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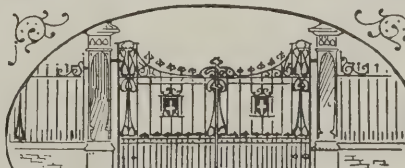
Velinheli, Penrhyn, and Westmoreland.

SLATE SLAB GOODS:

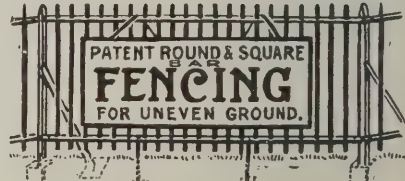
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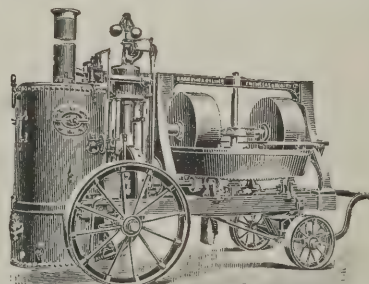
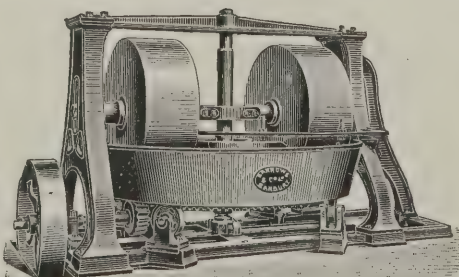
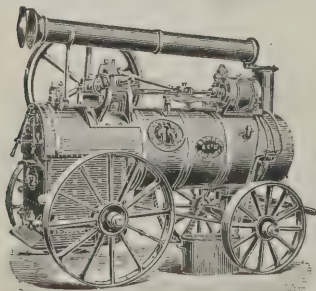
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GREEN SLATE QUARRIES.**The attention of Architects is
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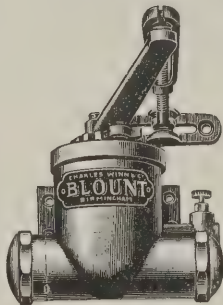
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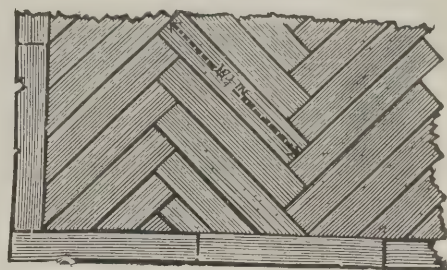
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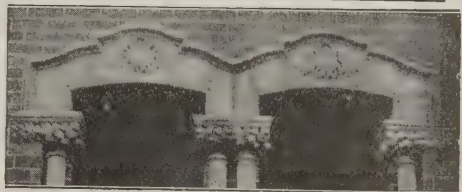
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(See displayed Advt. in issue for September 6, p. xix.)

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Staffordshire Quarries, Roofing Tiles, &c.**

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FORAGE.			
	£	s.	d.
Beans ... per qr.	1	12	0
Clover, best ... per load	3	12	0
Hay, good ... do.	3	3	0
Sainfoin mixture ... do.	3	7	0
Straw ... do.	1	10	0

OILS AND PAINTS.			
Castor Oil, French ... per cwt.	1	3	11
Colza Oil, English ... do.	1	2	3
Copperas ... per ton	2	0	0
Lard Oil ... per cwt.	2	15	0
Lead, white, ground, carbonate ... per ton	16	0	0
Do. red ... do.	15	0	0
Linseed Oil, barrels ... per cwt.	0	17	0
Petroleum, American ... per gal.	0	0	5 1/2
Do. Russian ... do.	0	0	5 1/2
Pitch ... per barrel	0	8	0
Shellac, orange ... per cwt.	8	18	0
Soda, crystals ... per ton	3	2	6
Tallow, Town ... per cwt.	1	5	6
Tar, Stockholm ... per barrel	1	5	0
Turpentine ... per cwt.	2	7	0

METALS.			
Copper, sheet, strong ... per ton	84	0	0
Iron, Staffs., bar ... do.	5	15	0
Do. Galvanized Corrugated sheet ... do.	11	0	0
Lead, pig, Soft Foreign ... do.	13	17	6
Do. do. English common brands ... do.	14	7	6
Do. sheet English, 3lb. per sq. ft. and upwards ... do.	15	0	0
Do. pipe ... do.	16	0	0
Nails, cut clasp, 3in. to 6in. ... do.	9	5	0
Do. floor brads ... do.	9	0	0
Steel, Staffs., Girders and Angles ... do.	5	7	6
Do. Mild bars ... do.	6	0	0
Tin, Foreign ... do.	145	15	0
Do. English ingots ... do.	147	0	0
Zinc, sheets, Silesian ... do.	27	15	0
Do. do. Vieille Montaigne ... do.	28	7	6
Do. Spelter ... do.	26	0	0

TIMBER.			
Soft Woods.			
Fir, Dantzie and Memel ... per load	2	12	6
Pine, Quebec, Yellow ... do.	4	0	0
Do. Pitch, American ... do.	3	3	0
Planks, log, Dantzie ... per cu. fath.	4	0	0
Deals, Mariehill, Yellow, 5th, 4x9 ... per std.	8	5	0
Do. Batsharsnas, Yellow, 5th, 4x5 ... do.	6	5	0
Do. do. do. 4x7 ... do.	6	2	6
Do. do. do. 4x6 ... do.	6	0	0
Do. do. do. 4x5 ... do.	5	10	0
Do. St. Petersburg, White, 1st, 3x11 ... do.	10	5	0
Do. Herasand, Yellow, 5th, 3x9 ... do.	8	0	0
Do. Petschora, Yellow, 2nd, 3x9 ... do.	13	5	0
Do. Keret, Yellow, 3rd, 3x9 ... do.	9	10	0
Do. do. do. 4th, 3x9 ... do.	8	5	0
Do. Archangel, Yellow, 3rd, 3x9 ... do.	10	0	0
Do. Kovda, Yellow, 4th, 3x9 ... do.	7	10	0
Do. do. do. Unsorted, 3x7 ... do.	7	5	0
Do. Langror, Yellow, 3x9 ... do.	6	0	0
Do. Nederkalix, Yellow, 1st, 2 1/2 x 7 ... do.	9	10	0
Do. do. do. 2nd, 3x9 ... do.	8	15	0
Do. Bure, Yellow, 1st, 2 1/2 x 7 ... do.	9	15	0
Do. Christiania, Yellow and White Unsorted, 2 1/2 x 7 ... do.	4	17	0
Do. Blankaholm, Yellow, 2nd, 2 1/2 x 7 ... do.	8	15	0
Do. Quebec, Spruce, Unsorted, 2 1/2 x 7 ... do.	7	15	0
Battens, all kinds ... do.	6	15	0
Flooring Boards rim. prepared, 1st ... per square	0	9	9
Do. 2nd ... do.	0	8	6
Do. 3rd, &c. ... do.	0	8	9

Coming Events.

- September 15-18.**
ARCHITECTURAL ASSOCIATION.—Week-end Visit to Cambridge. Leave King's Cross, Friday, 5 p.m. Return Monday, 7.30 a.m.
- Saturday, September 16.**
NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to new Royal Infirmary, Newcastle-on-Tyne.
- Monday, September 25.**
ARCHITECTURAL ASSOCIATION.—Day School commences at 9.45 a.m. and Evening School at 6.30 p.m.
- Saturday, September 30.**
NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Sketching Club Excursion.
- Wednesday, October 4.**
KING'S COLLEGE, LONDON.—Course of Training for Sanitary Inspectors in Building Construction commences.

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303	Do.	30 x 40 in.	4/9
304	Thin English	30 x 20 in.	2/9
305	Do.	30 x 40 in.	5/6
306	Thin Mineral	30 x 40 in.	7/-
307	Stout do.	30 x 40 in.	8/2
308	Royal Végetal	25 x 19 in.	4/9
309 1/2	Diamond	22 x 17 in.	4/-

No.	Sort.	Continuous. yds.	Per in. roll.
310	Thin French	21 x 43	4/9
311	Stout do.	21 x 43	6/6
312	Tough English, thin	21 x 40	6/6
313	Do. medium	21 x 40	7/10
314	Do. stout	21 x 40	9/-
315	Tough blue shade, medium	21 x 43	7/10
316	Do. stout	21 x 43	9/-
317	Thin glazed	21 x 43	6/-
318	Stout parchment blue or cream	21 x 40	10/6
319	Do. white parchment	21 x 40	11/9
320	Extra stout white parchment	21 x 40	11/9

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Imperial, 72 lbs.	5/-	7/3
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Antiquarian, 240 lbs.	40/-	2/6

Postage extra.

Whatman's or Arnold's.	Per Quire.
Royal, 44 lbs.	5/-
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" 90 lbs.	12/6
" 140 lbs.	18/6
Double Elephant, 133 lbs.	16/6

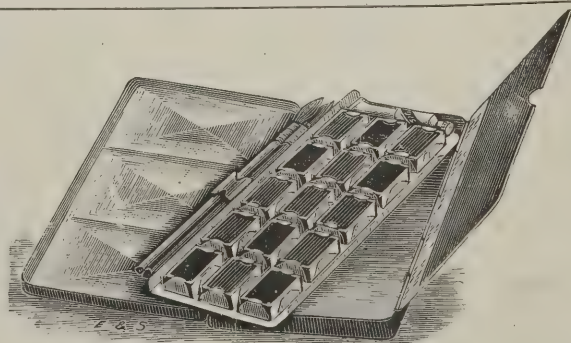
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THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

September 20, 1905. Vol. 22, No. 554.

6, Great New Street, Fetter Lane, E.C.

Summary.

In their report on the cheap cottages exhibition at Letchworth the judges point out that the site was exceptionally suited to economical building; the cheapness of bricks and cement here made it possible to erect substantial cottages at a price which compares favourably with that of either timber-built cottages of the same accommodation or of houses constructed of the various patent materials. They express the opinion that many of the competitors do not appear to have realized the problem before them, and that a number of the cottages are not suitable for agricultural labourers. (Page 170.)

The new chapel now being built for the U.S. Naval Academy at Annapolis furnishes a notable example of reinforced concrete work. The structure is circular, flanked by four wings and surmounted by a dome and cupola. The main problem in the design was due to the fact that the dome, being of smaller diameter (69ft.) than the circular main structure (83ft. 4ins.), had to be carried in cantilever over its supports. This eccentricity required the corbelling inwards of the whole structure supporting the dome, so that a cantilever construction was demanded in the main piers, the circular girder and the dome columns. The lantern which crowns the dome is of terra-cotta and weighs 120 tons. (Page 160.)

A great deposit of a remarkably fine creamy marble has been discovered in Sutherlandshire. (Page 165.)

Watts's equestrian figure of "Physical Energy" is being prepared for shipment to South Africa, where it will be erected at Groot Schuur. (This page.)

The Associated Portland Cement Manufacturers (1900), Ltd., declare a dividend on their preference shares at the rate of $5\frac{1}{2}$ per cent. per annum, but no dividend yet on the ordinary shares. (Page 165.)

The whole of the west end of St. Mark's is now covered by scaffolding, and it is calculated that eighteen months must elapse before this portion of the church is put in a proper state of repair. The present cracks are not thought to have been caused by the fall of the campanile, as there have been in operation for centuries certain influences which have slowly but surely weakened the structure—water under the foundations, salt air, and excessive weight imposed by mosaic and marble work. (Page 166.)

A new process of metal inlay has been introduced. It consists in alloying one metal with another—zinc on copper, for instance—and is adaptable to many decorative treatments. Its use on radiators and pipes is suggested. (Page 166.)

Anchors. It is remarkable that the provision of anchors in modern buildings has practically gone out of use. In many old buildings in this country they are to be found both used constructionally and forming pleasant decorative features. The form in which they are made so as to record the date of erection is well known. To this day in Belgium and the Netherlands anchors are very much used, though not always visible and decorative, being often concealed in the wall. They offer distinct constructive advantages in tying together walls and other parts of construction, and it would be better if architects provided them at the time of erection than that they should have to be inserted afterwards when the walls show signs of weakness. Floor joists often pull away from the walls, and in certain parts of the country the craftsmen still retain the traditional rule that joists should be tied into the wall with an iron anchor, however small the building. Of course in small house work it is not necessary, but where the spans are large or the height of a building is considerable anchors should not be slighted. They provide additional strength and save their cost over and over again. There are several varieties of anchors used in construction, namely, the ashlar anchor, for securing parts of ashlar facing to the backing, the usual form being that of a cramp; the spur anchor, for securing floor beams to masonry or brickwork; the star anchor, used as a tie-rod, this being secured to other portions of the building; and the wall anchor, used for tying parts of masonry or brickwork together, generally at the junction of two walls, and thus affording a means of bonding.

A Magnificent Piece of Sculpture.

It has been remarked more than once that the late G. F. Watts, had he devoted himself to sculpture instead of to painting, would have achieved even greater success with the chisel than with the brush; and certainly the few sculptures which he produced give every support to that belief. His most important and greatest work is the magnificent equestrian figure of "Physical Energy," which was erected in the quadrangle of Burlington House in connection with the Royal Academy Exhibition last year. This has just been taken down, and is now being prepared for shipment to South Africa. According to present arrangements it will be erected not on the Matoppos as once pro-

posed but at Groot Schuur, the Cape Town residence of the late Mr. Cecil Rhodes, to whose memory Mr. Watts, at the request of Earl Grey, consented that the statuary should be dedicated. It is understood that the original model has been offered to the British Government, and that places will be found in this country and in India for replicas of the noble work. It is quite a masterpiece of sculpture and is worthy to be seen side by side with the greatest Greek pieces, embodying as it does a splendid feeling for sculptural treatment.

Our Insurance: £750 to a Builder.

IN connection with our schemes of insurance we have just paid £750 to a builder for an injury to his left arm which necessitated amputation. This fact should be borne in mind by those who have not yet availed themselves of the advantages of our insurance. There is no need to worry about the chances of one's getting killed in a railway train or at the corner of the street or in any of the hundred other places where one might get killed nowadays in a world of hurry and speed; worrying about these things leads eventually to neurasthenia and the lunatic asylum; neither is it of any use to go about wrapped in antiseptic clothing, breathing through a nose-filter and eating chemically-treated beans and lentils in order to avoid contagion by disease germs all around us; nevertheless the numerous accidents which are reported in the newspapers are a continual reminder of the risks we all undergo, while at times of epidemic especially the chances of contagion are brought forcibly to our minds. Accidents on buildings are always happening, and all architects, builders and others concerned should not fail to insure themselves against these. We have hundreds of names on our books, but in the interests of readers we desire to see still more. Many claims have been paid at one time and another. The largest is that mentioned above, but others have been £10 10s. to a builder who was kicked by a horse, £6 to an architect who slipped down some steps, £6 to a builder who injured his face, eye and foot, and £4 10s. to an architect who trod on a rusty nail which entered his foot. These are not very large amounts, but they are ample compensation for the injuries. All readers are entitled to the benefit of our insurance schemes, of which there are three, and a pamphlet giving full particulars of each can be had on application.

A REINFORCED CONCRETE CHAPEL.

A NOTABLE example of the use of reinforced concrete is furnished by the new chapel now being built for the U.S. Naval Academy at Annapolis. We give herewith several detail drawings of the construction, taken from our American contemporary the "Engineering News." As will be seen, the chapel is a circular structure flanked by four wings and surmounted by a lofty dome and cupola. The dome shells, the arched roofs of the wings, the supporting piers and columns, the interior bracing and the floors, and their supports, are all reinforced concrete. This concrete skeleton is, however, completely concealed by a covering of granite, white brick and terra-cotta on the outside, and on the inside by the interior finish and decoration. The present description covers the reinforced concrete work.

The main supports of the building are eight piers arranged in pairs, 90 degs. apart, around the periphery of a circle 83ft. 4ins. in diameter. These columns are vertical to a height of 35ft.; then they corbel radially inwards until the distance between inside faces of diametrically opposite columns is reduced from 83ft. 4ins. to 72ft. 10ins. The corbelled tops of the columns are surmounted and connected by a circular girder, which is a ring cut from a hollow cone and has an inside diameter at the bottom of 72ft. 10ins. and at the top of 69ft. 8ins. On the top of this circular girder are spaced 24 columns, which corbel inwards like the main piers and carry a second circular girder similar to the first. This last girder carries the shells forming the main dome and the ceiling dome. The lantern is carried by a pyramidal framework, whose spreading legs set into the main dome shell near its bottom. There is also a system of struts between the piers, as indicated in Fig. 1.

The four wings of the building form transepts to the main auditorium, and each is roofed by a segmental arch, supported at its four corners by the main piers and by two separate columns. As these roof arches carry no load except their roof covering, the thrust on the columns is readily taken up by a tie across the front of the arch. Fig. 1 shows this arrangement clearly. The remaining structural framework of the building, all of which is of reinforced concrete, comprises the main and gallery floors, and is indicated by the drawing.

It will readily be seen from the preceding general description that the main problem in the design was due to the fact that the dome, being of smaller diameter than the circular main structure, had to be carried in cantilever over its supports. As stated above, the piers are rectangular and vertical to a height of 55ft. above the footings and then corbel radially inwards toward the centre of the building. The eccentricity of the loading, due to the corbelling, made it necessary to reinforce the outer face of the column to take tension and the inner face to take compression. The compression bars had butt joints enclosed in steel sleeves. All the vertical bars were tied together at intervals by horizontal peripheral hoops of $\frac{1}{4}$ in. rods. The piers are on concrete footings 13ft. 6ins. by 16ft. 6ins. on plan, which bring a load of about 4 tons per sq. ft. on the soil.

The architect's plan required the dome to be carried on twenty-four columns. To connect these columns with the supporting piers the tops of the latter were bridged by a circular girder, on which the dome columns took footing. A half plan and diametrical vertical section of this girder are shown in Fig. 2. Fig. 3 shows radial sections of the girder at two points. It will be noticed that the girder is corbelled inwards and carries a gallery in cantilever. These eight points of support alone, however, left a considerable span of girder unsupported, as shown by the

FIG. 1.—PLAN AND SECTIONS OF CHAPEL FOR THE U.S. NAVAL ACADEMY AT ANNAPOLIS.

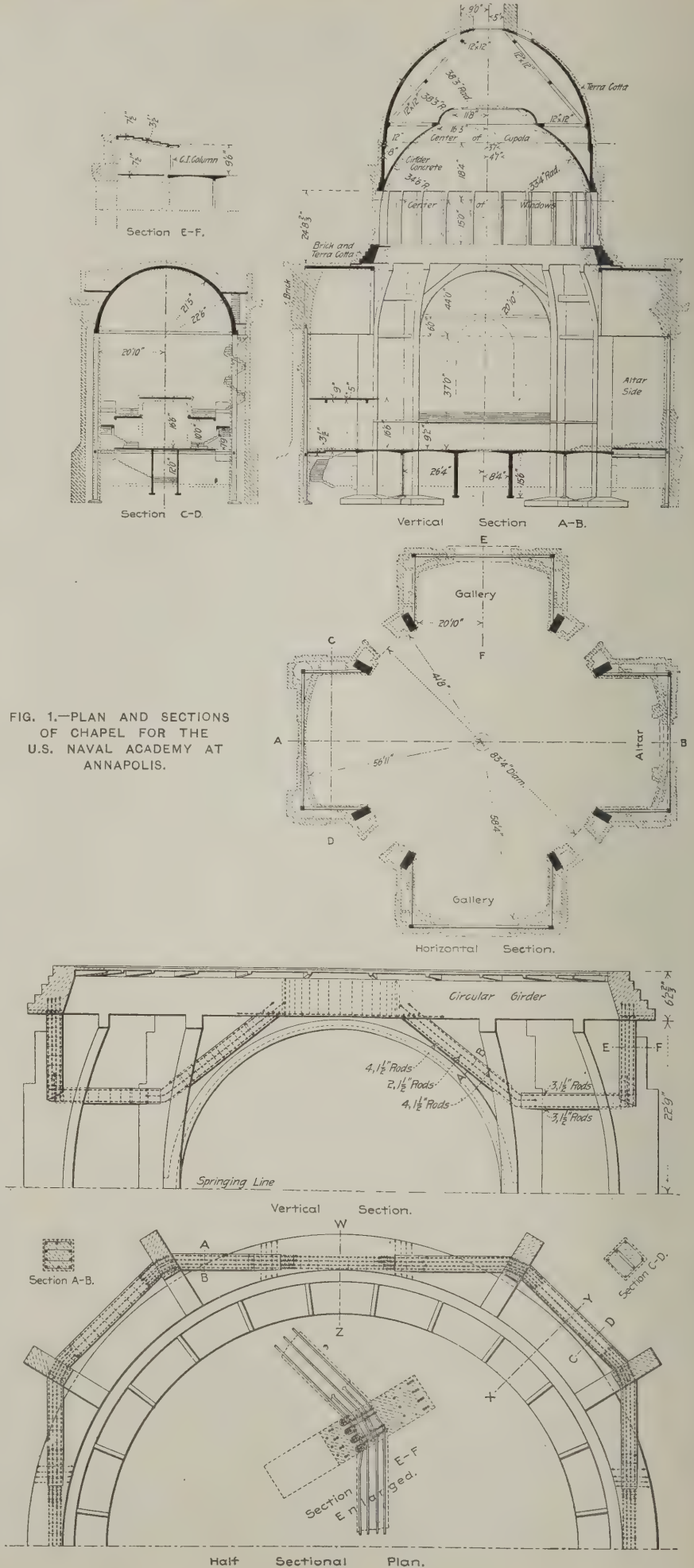


FIG. 2.

plan, Fig. 2, and braces were therefore introduced, reaching diagonally from the piers to the girder. The thrust of these brackets against the piers was transmitted to the companion piers of each pair by a horizontal strut, and it is important to note the interlocking of the strut and brace reinforcement and the bonding of the brace reinforcement into the girder.

The twenty-four columns supporting the dome take footing at equidistant intervals around the circular girder, and are bonded into this girder by their reinforcement, as shown in Fig. 3. These columns are corbelled inwards like the main piers and carry a circular ring, on which the shells of the dome rest. The columns are bonded into the dome ring in much the same way as the main piers are bonded into the large circular girder.

The dome proper of the building, as shown in Fig. 1, consists of two shells, both of which are carried by the circular ring. Figs. 4 and 5 show the details of the shell construction. It is to be noted first that the inner and outer shells are braced together by a system of radial struts, and that the outer shell is stiffened by a pyramidal framework which takes the weight of the lantern off the crown portion of the shell and carries it to points low down on the haunches. The detailing of this framework and of the various parts of the shells is clearly shown by the diagram and need not be elaborated here. It is important to note the boldness of the design providing for a dome shell of 69ft. interval diameter and only 8ins. thick at the thickest part.

The lantern which crowns the dome is of terra-cotta and weighs 120 tons. It is anchored to the outer dome shell to resist wind strains, but its weight is relieved from the shell by the pyramidal framework previously mentioned. It was impracticable to make the shell strong enough to carry the cupola because of the series of skylight openings at the crown.

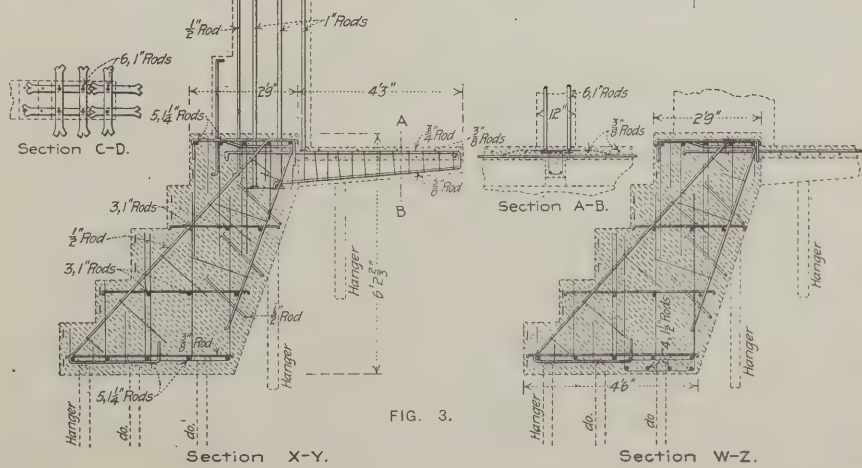
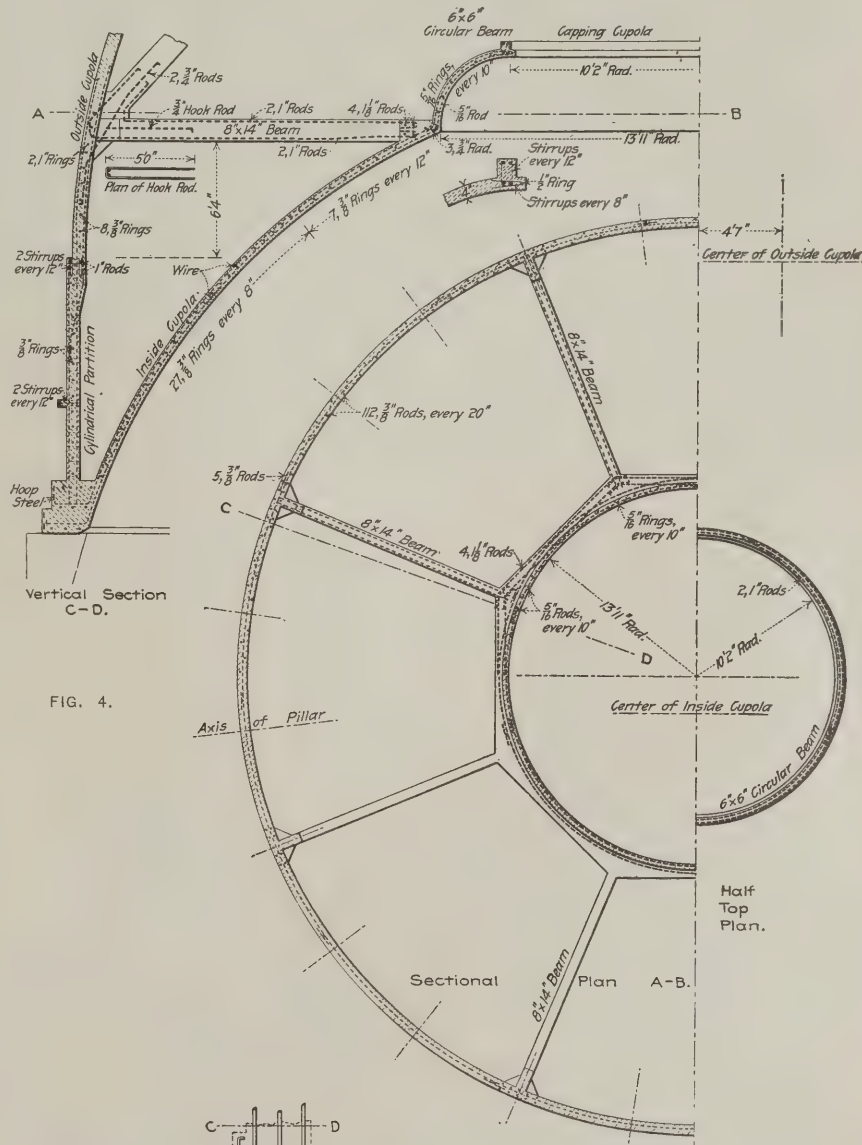
The only parts of the wings that call for attention are the roof arches and their supports. The arches are semicircular segments, with a clear span of 42ft. roins., a crown thickness of 8ins. and a thickness at skew-backs of 14ins. This circular shell connects into the main piers at its inner end and is carried on two columns at its outer end. To prevent these isolated columns from spreading under the arch thrust a tie is carried across the arch at this point. The columns are rectangular, with a vertical bar at each corner and hoops connecting these bars at smaller intervals vertically.

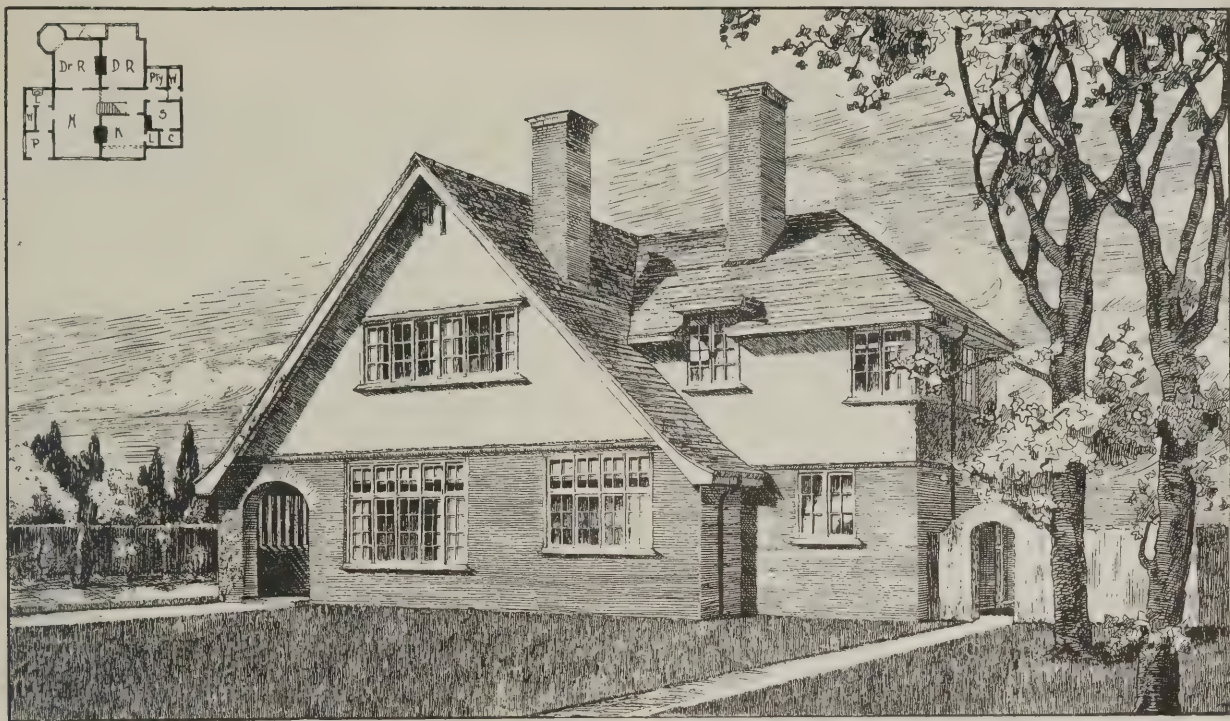
The main floor of the chapel is composed of thin flat top concrete arches carried by the main piers, a circular row of concrete posts and a circular concrete wall. This construction is clearly indicated by Fig. 1, which also shows the gallery floors and those of the altar and organ-loft. The stairways from the crypt to the main floor and from this floor to the galleries and lofts are all straight run stairs of reinforced concrete. A spiral stairway around one of the columns carrying the arch roof of the north wing, and enclosed in the curtain walls (as shown by the plan, Fig. 1), gives access to the roof. This stairway is also of reinforced concrete.

To ensure clearness, the preceding description has been held closely to a bare statement of the structural parts of the chapel as shown by the drawings, and needs to be supplemented by further explanation of the conditions influencing the design, and other general aspects of the work. It is important to explain first that the original plans of the architect called for a solid concrete construction for the walls, and this concrete was to be faced with brick, granite, terra-cotta, &c. Tenders were asked on these plans, and when received were found to exceed the amount appropriated for the

chapel building. Contractors were then asked to propose designs of their own, on the condition that the architectural lines of the building be respected. The Noel Construction Co., of Baltimore, proposed a design made by the Baltimore Ferro-concrete Co., and were awarded the contract. Compared with the original design for solid concrete walls, dome and roof arches, the new design first decreases the load by substituting reinforced concrete for the dome shells and roof arches, and then carries this load to the foundations by piers instead of by the building walls. This made it possible to enclose the building with hollow walls and thus materially cheapen the construction.

The substitution of the new design involved several structural difficulties. As has been noted in the preceding description, the diameter of the dome is 69ft., while the piers which support it are set with their inner faces on the circumference of a circle 83ft. 4ins. in diameter. The eccentricity of the dome shell with respect to its main supports is thus 7ft. 2ins., and this eccentricity had to be provided for by corbelling inwards the whole structure supporting the dome, so that a cantilever construction was demanded in the main piers, the circular girder and the dome columns. This explains the complexity of the reinforcement and the intimate bonding of the several connections. In this





COTTAGE AT SUNNINGDALE, BERKS. CHAMBERS AND MARTIN, ARCHITECTS.

This house is nearing completion for Mr. E. Tindal Atkinson, and is one of a number in course of erection from the designs of Messrs. Chambers & Martin, architects, of London. It is built of red bricks up to the first floor, the upper part being rough-cast, finished white. The hall is of unusual size for so small a house, but it is intended as a sitting hall. The cost is about £1,600. Messrs. Frank Harris & Co., of Barnsbury, are the builders. The situation is excellent, facing golf links back and front.

by Mr. Twelvetrees before the Civil and Mechanical Engineers' Society, which has been reprinted in pamphlet form. This deals with the design of reinforced concrete beams, and consists of a summary of what is set out in greater detail on this particular branch of the subject in the author's book.

"Concrete Steel," by W. N. Twelvetrees. London and New York: Whittaker & Co., price 6s. nett.
"The Design of Concrete-Steel Beams," published by the Civil and Mechanical Engineers' Society.

Italian Architecture.

This interesting and instructive essay by the Rev. J. Wood Brown will well repay perusal. It gathers into a small compass a general purview of a very wide field of architecture, embracing the earliest examples of Rome to the later Renaissance. This concentration, which of course has its disadvantages, contrasts the different styles on the one hand and shows their evolution and relation on the other hand. Mr. Brown first takes the subject of concrete architecture as typical of the Romans, but fails to give due consideration to the constructive ability displayed. He talks as though wood centering were the only thing used, and seems to miss the real function of the tile facing and arched ribs—so masterfully enunciated by Choisy. However, the author recognizes that architecture is building art, and that all consideration of styles must primarily depend upon due appreciation of the advance of constructive knowledge of the builders, and his comparative criticism and explanation of Basilican, Byzantine, Lombard Romanesque, Gothic Romanesque and Renaissance architecture is highly interesting.

"Italian Architecture: Being a Brief Account of its Principles and Progress," by J. Wood Brown, M.A. London: A. Siegle, 2, Langham Place, W., price 1s. 6d. nett.

Law Cases.

Insufficient Hoarding around Buildings.—Mr. F. C. Hornbuckle, builder, was summoned at the Sheffield City Police Court last week for not having erected close boarded hoardings around some houses he was building in Ellesmere Road and Scott

Road. The houses had a frontage of 80ft. No fencing at all was put up when building was commenced, but eventually some was erected in front. As the houses were in a hollow this was necessary; 15ft. of the frontage, however, was left unfenced, and this constituted the offence stated in the summons. Defendant pointed out that this space was for the purpose of allowing building material to be brought in. Upon promising to attend to this unfenced portion, he was fined 5s. and costs.

Correspondence.

Architectural Refinements in Mediaeval Buildings.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I have read with interest the article on architectural refinements in mediaeval buildings published in your issue for last week. Some years ago, before the Goodyear Exhibition was heard of, and being quite unprepared to meet with optical refinements in Gothic work, I happened to be studying fifteenth-century architecture in Wells. Standing at the lower entrance near the chapter-house, the view looking up the vicars' close greatly impressed me. The close contains forty-two vicars' dwellings, arranged upon opposite sides of an apparently straight and parallel carriageway. Each dwelling consists of two rooms, a small yard behind, and a garden in front surrounded by a dwarf stone wall. The buildings are of rubble with cut-stone dressings, in two storeys, and their ornate chimneys form a prominent feature in the perspective. On referring to a plan of the close published in Pugin's "Examples of Gothic," vol. iii., I found that although the close is ostensibly parallel the width at the lower end is 65ft. between building lines, while that at the upper end is only 56ft., giving lines which are out of parallel to the extent of 9ft. in a length of 436ft., or nearly 1 in 49, a fraction quite imperceptible to the eye of a casual observer. In addition to the convergence of the main building lines, there is also a con-

vergence of the dwarf walls bounding the front gardens to the extent of 7ft. in the same length of 436ft., thus assisting in the illusory effect. There is no doubt that these converging lines add considerably to the picturesque effect of the close, and it seems to me that there is no doubt that the buildings were laid out in this way intentionally, since in other respects the lines are straight and the angles square, there having been apparently no restrictions on the original site.

Not hitherto having seen attention called to this instance of architectural refinement in planning, it struck me that some readers might be glad to have their attention called to this case. It also points to the possibility that if other mediaeval buildings are carefully examined the secret of their beauty may be found to lie partly in similar devices.
—Yours truly, HAROLD BUSBRIDGE.

PLUMSTEAD.

[The Goodyear Exhibition at Edinburgh will remain open till the end of October.]

Competitions.

Rochester Technical Institute.—Mr. Baggallay has made the following awards in the competition for a new technical institute at Rochester. First premium, No. 72, Messrs. Russell & Cooper, London; second premium, No. 74, Messrs. Crouch, Butler & Savage, Birmingham; third premium, No. 45, Mr. W. H. Knowles, F.R.I.B.A., Newcastle-on-Tyne. The designs were on exhibition at the Corn Exchange, Rochester, last week.

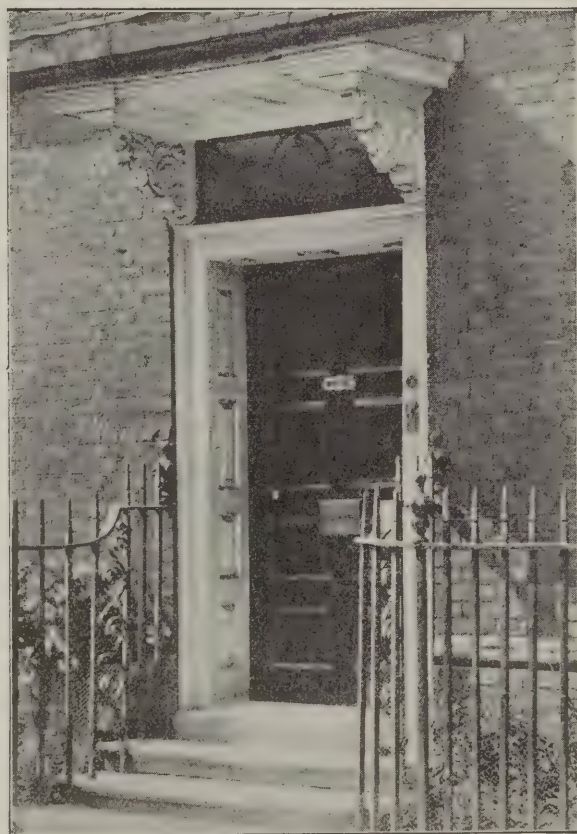
New Chapel and School at Bradford.—The competition for a new chapel and school at the corner of Shearbridge Road and Woodhead Road, Bradford, to replace Mannville Chapel and School, has been decided in favour of Mr. E. H. Parkinson, who, out of the four Bradford architects invited by the trustees to submit designs, was awarded the first premium of £10 10s. Mr. W. E. Potts, A.R.I.B.A., of Messrs. Potts, Son & Hennings, of Manchester and Bolton, was the assessor.



CONSERVATIVE CLUB, LEWISHAM.



HOUSE AT RYE, SUSSEX.



HOUSE ON THE GREEN, RICHMOND, SURREY.



HOUSE AT RYE, SUSSEX.

SOME EIGHTEENTH-CENTURY DOOR-HEADS.

Whatever may be the individual opinion of eighteenth-century architecture, we have at least to be thankful to it for handing down a number of most delightful door treatments, of which the four examples on this page are thoroughly representative. The Doric door head on the Conservative Club at Lewisham, with its pilasters, is excellently proportioned and dignified; that at Richmond is one of many to be seen there—relics of a day when there was no such thing as a District Railway; while the two examples from Rye serve to accentuate the difference between the ordinary designs of then and now. The ironwork shown is also worth attention. It is to be regretted that much of this old woodwork is often thickly coated with paint which clogs up all the fine carving.

Builders' Notes.

"Victor" Spring Hinges, the patent of Mr. Robert Adams, of 3 and 5, Emerald Street, Theobald's Road, W.C., have been selected in competition for use throughout the new War Office in Whitehall.

Swedish Granite is largely imported into Aberdeen. While Aberdeen granite is the best for durability, it has not the variety of texture and grain found in the Swedish quarries. Architects are specifying very freely for Swedish granite.

Superannuations for Carpenters and Joiners.

—The members of the Amalgamated Society of Carpenters and Joiners are said to be in a state bordering on panic through fear that the superannuation provisions are altogether inadequate.

The Building Trade continues depressed and competition to secure the few contracts going is very keen. The brick trade is deplorably demoralized, and it appears impossible to move off the heavy stocks covering the yards at the chief centres of manufacture throughout the country.

New Barracks for York.—At a meeting of the Streets and Buildings Committee of the York City Council last week a letter was read from the War Office authorities asking whether the council could place at their disposal a site of about fifty or sixty acres on which barracks might be built.

Discovery of Marble in Sutherlandshire.

—On the Sutherlandshire portion of the estate of Sir Charles Ross, Bart., of Balnagowan, a great deposit of a remarkably fine marble has been found. Samples have been submitted to leading marble merchants, who pronounce it to be excellent, while Mr. Brock, R.A., and other sculptors unanimously concur in stating that it is a marble of remarkable purity and very fine texture. It is of a creamy colour.

The Derwent Valley Water Board is spending something like £6,000,000 on behalf of Sheffield, Leicester, Derby, Nottingham and the counties of Derby and Notts, but the public are given little opportunity of knowing what it is doing or how it is doing it. The Board is practically a close corporation. Now and then, through the advertisement columns, it is possible to see that the Board is in search of tenders. But contractors in the towns immediately concerned receive small consideration.

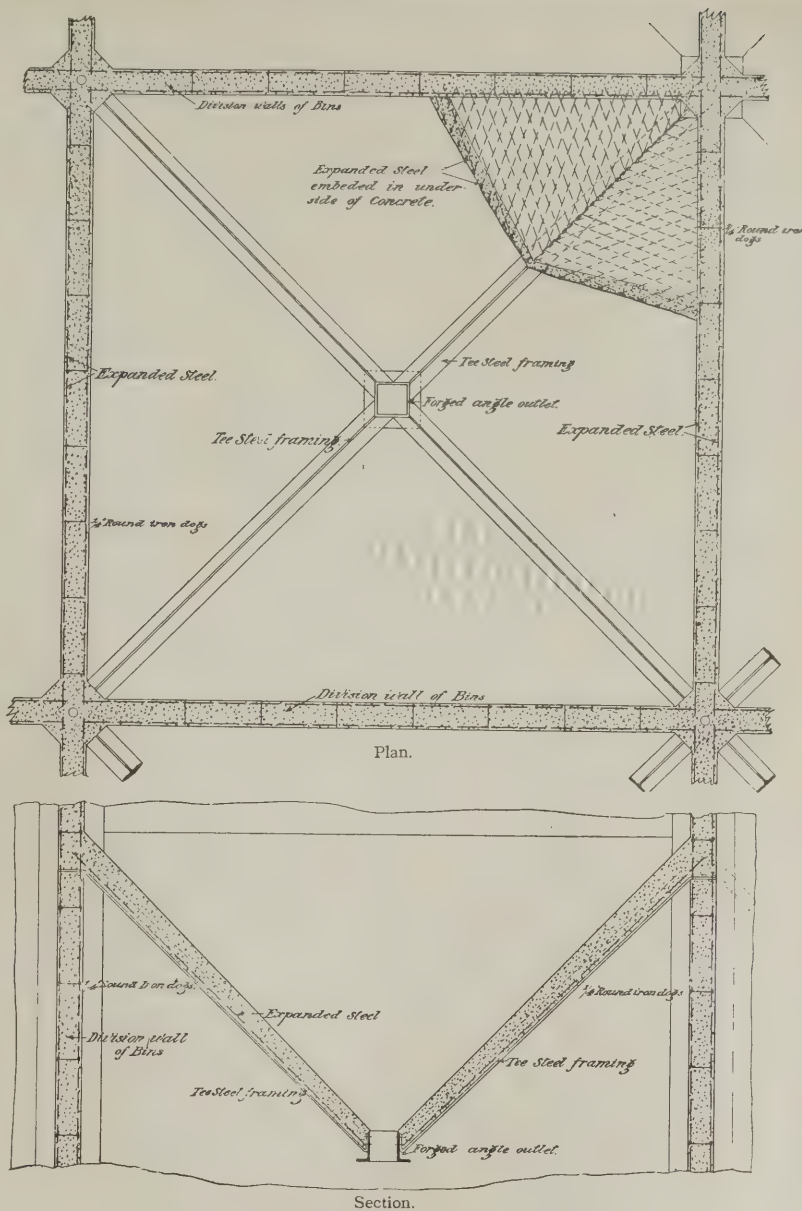
Sunderland Building Trade Dispute.

—A conference between the builders and plasterers at Sunderland took place in the town hall last week, on the invitation of the mayor (Councillor F. Foster), to see if some settlement of the dispute between them could not be arrived at. There was an agreement on all points of the rules excepting on the question of lathing, which the masters declared was a special class of work. The conference was brought to a close without considering the wage question, and was adjourned *sine die*.

Bath Stone Facing: An Old Patent.

From the "Times" of July 4th, 1816:—Sir,—For the information of those who may be interested in architectural improvements, I wish to communicate through your paper, that by license from the patentee, I undertake to case buildings with Bath stone at less than half the expense of common ashlar, and in such a manner as to render the walls perfectly waterproof; and also that I prepare a new species of inlaid pavement for floors, far surpassing in beauty and variety of design, the ancient works of that nature. — J. C. CARTER, 1, Dean Street, Soho.

Associated Portland Cement Manufacturers (1900), Ltd.—The report of the directors and statement of accounts to June 30th, to be presented at the sixth ordinary general meeting of the company to-day, give a



A HOPPER BOTTOM FOR SILOS.

The above illustration shows a method of forming hopper bottoms to silos, &c., which has been adopted in various places. The descriptive notes on the drawing are self-explanatory. Expanded metal is laid in the walls with the longway of its mesh horizontal, and is distanced by means of round iron-dogs and kept about $\frac{1}{4}$ in. from each face of the wall. An enormous block of silos on this system was constructed at Madero Dock, Buenos Ayres, to the designs of Messrs. Sir Douglas Fox and Partners and Messrs. Livesey, Son, & Henderson.

profit of £333,194 for the year's working and recommend the payment of a final dividend on the preference shares at the rate of $5\frac{1}{2}$ per cent. per annum. "The report and balance-sheet," says the "Financial News," "may truly be said to be the record of an undertaking struggling for existence against heavy odds. . . . Over-capitalized from the commencement, the company has since been compelled to resort to raising still further moneys, and thus its financial prospects have been handicapped additionally in the interests of its commercial requirements. At the present time the paid-up capital of the concern amounts to no less than £6,539,104. . . . Under such onerous conditions it is needless to say that up to now there has not been any dividend payment in respect of the ordinary shares."

Proposed Garden City Suburb for Bradford.—A Bradford building scheme which may prove of much interest was foreshadowed at a meeting of a sub-committee of the Bradford Buildings Committee last week. It was stated to the committee that a Bradford gentleman had under consideration a scheme for the building of a series of small semi-detached houses on the principles

already carried out in the various "garden cities" in the country. It was proposed that a plot of land of 14 acres in the highest part of Allerton, and in close proximity to the tramway, should be devoted to the purpose, and it was suggested that only twelve houses should be erected to the acre, so that fair-sized gardens could be provided. Each house was calculated to cost from £150 to £180, independent of the value of the site and of the cost of making roads. The matter came before the committee on a question relating to the roads. The building by-laws require the provision of a roadway at least 14 yds. wide between house and house or, if the houses are set back from the road, between garden and garden. The committee were invited to say whether it would be considered within the terms of the by-law if—in order to give a more rural appearance to the colony—the 14 yds. of the roadway were divided so that a road 7 yds. wide should be provided with a grass plot on either side, 3ft. 6ins. wide, planted with trees, and that outside these plantations foot paths each 6ft. wide should be made. The matter will be fully considered at a future meeting.

CONDITION OF THE ALHAMBRA.

THOUGH the alarming report that the Alhambra is threatened with destruction may prove to be exaggerated, no recent visitor to Granada can have failed to notice the neglected appearance of the celebrated Hall of Ambassadors and the still more famous Court of Lions, unique of its kind. The Alhambra has had rather more than its fair share of mishaps since Boabdil surrendered it to the Spaniards in the same year that Columbus discovered the New World. A great part of the Alcazar was burned down in 1524, and what the flames spared was wantonly swept away to provide a site for Charles V.'s displeasing palace. In 1590 the explosion of a powder magazine, which ruined the Cuarto Dorado and several rooms lying off the Court of Lions, provided the novelist and poet Vicente Espinel with a subject for an ode—a poor compensation. Much damage was done in 1883 while an electrical apparatus was being fitted up, and in 1890 a serious fire which might easily have destroyed the whole building was luckily discovered and extinguished in the nick of time. The immediate danger at the present time is said to be due chiefly to an unusual succession of the slight earthquake shocks which are not uncommon in the neighbourhood of Grenada, and if this be so it should not be beyond the skill of experts to avert it. Some necessary underpinning and much more stringent precautions against the risk of fire are desirable and even urgent, but the less tampering with the details of the Alhambra the better.—(From the "Manchester Guardian.")

"SHERARDIZING."

A new Process of Metal Inlay.

WORKS have just been completed for a new process of dry galvanizing called "Sherardizing," the invention of Mr. Sherard Cowper-Coles, of Grosvenor Mansions, Victoria Street, Westminster. By the ordinary process of hot galvanizing it is necessary to first clean the iron from grease, &c., either by "pickling" in acid or sand-blasting, and then to dip it into the molten zinc. In "Sherardizing" it is not essential to clean the metal in this way, though of course all scale needs to be removed; but the great feature of the process is that zinc dust instead of molten zinc is used, and at a much lower temperature, the articles to be galvanized being enclosed for a few hours in a cylinder charged with the dust, which is heated to about 500 degs. Fahr.

This matter is of interest to builders and contractors, but architects will be more concerned with the fact that other metals besides iron can be "Sherardized"—aluminium and copper, for instance—and thus a new method of decoration—a metal inlay—is available. By this process inlaid metalwork can be made similar in effect to the finest Damascening, or, on the other hand, the process readily lends itself to bold work, such as panels, as, by a variation of temperature, one metal is inlaid into another and at the same time one metal can be considerably raised above another at the will of the operator. Various effects are obtained with steel plates inlaid with zinc, the steel being blued to render it rustless. As another example of the effects obtained by this process, a copper tray can be taken and inlaid with zinc, matters having been so arranged that a considerable portion of the copper is converted into a gold-coloured brass, thus giving a very soft effect with great subtlety of colour; or silvery zinc may be obtained on a plain background, and by altering the preliminary treatment and varying the length of stoving it is possible to act upon the base

metal so as to obtain instead of the copper very beautiful effects ranging from silver-white zinc through yellow brasses and bronzes of various shades graduating to the red copper. One of the many applications of this process might be the decoration of radiators, pipes, &c.

THE STATE OF ST. MARK'S.

ANYONE visiting Venice at the present time and seeing church after church invested with scaffolding might be tempted to form very pessimistic views about the stability of the City of the Lagoons, says the correspondent of the "Morning Post."

The whole of the west end of St. Mark's is now covered by scaffolding, which goes to within 6ft. of the roof and has cost £1,500. The cracks in the mosaic are very noticeable when one ascends by a series of ladders to the highest platform of this scaffolding, and it is calculated that eighteen months must elapse before that portion of the church has been put into a proper state of repair. The work is naturally of a very delicate character, and the men employed must be skilled and well paid. Fortunately, like the workmen engaged in the excavation of the Roman Forum, they are keenly interested in their work.

The rise of certain parts of the floor, which led to a person breaking his leg over a projecting fragment of the paving some months ago, has necessitated relaying in a few places. This has, however, been done with the utmost care. To level the floor would be an impossibility architecturally, besides being a gross act of vandalism.

Cracks not due to the Fall of the Campanile.

It is not considered that the present cracks in St. Mark's are due to the effects of the fall of the Campanile. There have been in operation for centuries certain causes which have slowly but surely weakened the structure. Only 5ft. below the floor there is water, which has had a bad influence on the foundations. Worse still, the salt air of Venice, especially during the winter, when cold mists are prevalent, has a destructive effect on all ironwork. The Venetian Republic would not, it is true, allow any iron bars to be placed as supports in a visible position in St. Mark's; but along the galleries are numbers of iron fastenings, put there by Sansovino, when he executed repairs at the church. A further cause of the cracks is the vast weight of the materials super-added to the original structure when the church was richly decorated and altered, without any increase in the strength of the foundations.

The question of expense is not serious. During the Austrian occupation St. Mark's enjoyed an annual donation of £2,400, and this liability was taken over by the Italian Government in 1866 and continued since then. As the work of repairs must of necessity proceed slowly, and long preliminary studies were required, so far the cost has been relatively small. Unforeseen cracks may, of course, render the task of repairing the building more arduous, for Venetian edifices are full of surprises; but persons in a position to judge do not share the view expressed in some quarters that St. Mark's is doomed.

Other Crutches and Splints.

Extensive works are also going on at the Church of San Giovanni e

Paolo; the side of the Doge's Palace adjoining the Bridge of Sighs is shored up by means of huge planks and beams; the campanili of both Sta. Maria Formosa and San Giorgio Maggiore are enveloped in scaffolding; and that of Burano is still rent and unrepaired. In short, Venice is in the hands of the workmen, and some years must elapse before she emerges from her crutches and splints.

BARRACK BLOCKS AND STABLES.

The Large Camp at Bordon.

BORDON CAMP, in Woolmer Forest, has just been completed. It covers an area roughly estimated at a couple of square miles. The main buildings consist of six large brick-built barrack blocks, with accommodation for nearly 1,000 men. These blocks are connected by covered asphalted ways, and there are spacious dining-halls, cook-houses, washing-places, baths, stores, &c. The eighteen troop stables will accommodate about 530 horses, and harness-rooms are attached. There are two blocks of gun and wagon sheds, each block being 40ft. wide and 350ft. long. The many other buildings, all built in brickwork, comprise forage-barns, corn stores, mobilization equipment stores, shoeing sheds, battery offices and stores, meat stores, brigade division shops, coalyards, &c. A spacious riding-school and gymnasium has been provided, also schools for adults and infants, together with mess-rooms, canteens and laundries. Quarters have also been constructed for 103 soldiers' wives and families. The officers' quarters are detached. The officers' mess-room has a frontage of 200ft. The warrant officers and quartermaster have separate quarters. A fire station occupies a central position on the Farnham and Petersfield main road, which runs through the camp. Messrs. T. J. Hawkins & Co., of Ashford, were the contractors for this extensive collection of military buildings.





NEW PREMISES IN PORTUGAL STREET, LINCOLN'S INN FIELDS, LONDON, W.C. HORACE FIELD, ARCHITECT.

These new premises are occupied by Messrs. George Bell & Sons, publishers, and "The Church Times." The building is faced externally with dark red bricks, with dressings of a lighter colour. The stone is Portland. The cornice is of cement cast *in situ*, the enrichment having been carved before the cement had set. The builders were Messrs. Chinchin & Co., of London.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Royal Sanitary Institute Examinations.

X. writes: "Have you, or are there, published any of the questions and answers set by the Royal Sanitary Institute for their examination in 'Sanitary Science'?"

You can get what you want from the Sanitary Publishing Co., 5 Fetter Lane, E.C.

Damp Walls.

ROCHDALE.—F. O. writes: "Which is the best way to treat the gable wall of a house (gins. solid) for dampness, which rises to a height of about 7ft. above ground-level and takes the plaster off the wall inside? It has brick footings, but no damp-course."

Insert a sheet damp-course in short lengths by removing one or two bricks at a time.

Architects' Fees.

BATLEY.—W. R. S. writes: "Is a person connected with some trade who has not been articulated and trained in a proper manner as an architect entitled to claim fees in a court of law for work of an architectural nature, such as the preparation of plans for a building?"

Yes, certainly.

Association of Municipal and County Engineers.

GLASGOW.—G. M. writes: "Please state the qualifications and course of study necessary to become a member of the Association of Municipal and County Engineers. I have had the usual training as a civil engineer and hold several South Kensington certificates."

Write to the secretary at 11, Victoria Street, Westminster, S.W.

'Area of Classrooms in Secondary Schools.

HIGH WYCOMBE.—SCHOLAR writes: "I recently prepared plans for some secondary day schools, and have been told that classrooms should give a minimum area of 18 sq. ft. per child. Some of mine have between 15ft. and 16ft. only. Is not 15 sq. ft. sufficient; and is there any limit to the total number of pupils for, say, seven classrooms?"

All classrooms in secondary schools must have a floor area of 18 sq. ft. per scholar, or 12 sq. ft. exclusive of a space for the master or mistress, which must be the full width of the room and 7ft. 6ins. from wall to front row of desks. No classroom should contain more than thirty nor fewer than fifteen scholars and all must have single desks. You should apply to the Board of Education for a copy of the building rules. T.

Removing a Church to Another Site.

In further reply to the enquiry on this subject, J. L., clerk of works, Edinburgh, writes: "Trinity College Church, Edinburgh (Gothic), was removed about 1848 to make way for the North British Railway under the supervision of the late Mr. David Bryce, F.R.I.B.A., R.S.A., architect. The stones were all previously numbered, then stored in an open field, and the church re-erected on its present site about twenty years later—or at all events a portion of it. 'Free St. George's,' Edinburgh, designed by the late Mr. David Cousin, the city architect, was removed about 1868 from Lothian Road to make way for the Caledonian Railway,

and was re-erected on its present site under the supervision of the late Mr. John Dick Peddie, R.S.A., architect. It is now known as Stockbridge U.F. Church, Edinburgh, with an addition to the height of the tower which improved it very much. This church should have 'A.L.'s special attention."

Mr. Harry Hems, of Exeter, writes: "Why not take the bull by the horns and move the fabric bodily? I have seen churches, both in the United States and in Canada, underpinned, lifted by jacks and moved on rollers. What man has done man can do."

On Becoming an Architect.

HINCKLEY.—C. A. W. writes: "What steps do you advise me to take in order to make my son, aged 16, an architect? He has passed the Oxford Junior, and will stay at school another year and take the Senior examination. Is it absolutely necessary that he be articulated to an architect in practice? What is about the premium required in this case?"

We advise that you should send him to the Architectural Association Day School in Tufton Street, Westminster, for a couple of years, and article him for three years to a young architect of standing who has a varied practice. The latter is most advisable; the premium varies from £20 to £200, according to the standing of the architect, but you would probably find £50 sufficient if the Architectural Association Day School course had been taken. You should apply to the secretary of the Association for particulars.

Ancient Lights.

KENSINGTON.—J. P. writes: "The accompanying plans (not reproduced) show a proposed new building and an adjoining ancient light. I have approached the adjoining owners, and the only reply I can get from them is that if I build it is at my own risk. Do you think there is a substantial interference with the right of light sufficient for the adjoining owners to obtain power to compel me to pull down the building if I go on with the work, or for them to obtain compensation; and if so, how much? Am I right in assuming that the interference of lateral light is a minor matter? There is at present an evergreen hedge 6ft. high where the new wall will come, which stops a portion of the light; and the ancient light in question is half-covered with ivy."

We do not think there will be any serious diminution of the amount of light. No doubt if the ivy were removed the lighting would be as good after the erection as before, but we doubt if the existence of this materially strengthens your case. It is the window, not the ivy. From the most recent legal decisions it appears that a person is only entitled to as much light as is necessary for the purpose for which the room is used, and in this case no material damage could be held to be done. We should risk an action, and if proceeded against should make the neighbour an offer for the obstruction of his light rather than go to court, unless he asks a preposterous sum. In the latter case you could only be made to pay compensation.

Building Trade Terms.

HULL.—A. G. writes: "Kindly explain the meanings of the following terms. I have referred to various books but have not been able to get what I want:—(1) *Spit*, referring to depth of soil to be removed. (2) *Flaunched*, referring to chimney-pots bedded in brickwork. (3) *Rubbed*, referring to the treatment of stonework. (4) *Stub*, connected with terracotta work. (5) *Verge*, connected with slater's work in roof. (6) *Dinged*, connected with treatment of walls for plasterer's work."

(1) "A spit deep" is the distance to which the ordinary spade is thrust in from the surface. (2) Applies to cementing round the

base of the chimney-pot. It means that the cement should be well carried or played up the chimney-pot, so that the weathering may be sharply inclined so as to throw the water off and prevent it penetrating and doing damage in frosty weather. (3) Ground to a smooth surface by rubbing with a stone or metal block or by placing one stone on another. (4) A stub or nib is a projection on the head of a tile for hooking over the lath. (5) A verge is that part of a sloping roof which projects beyond a gable or half-gable. Verge and the terms compounded with it are used in contrast to eaves and its compounds. (6) "Dinging" is an ambiguous term variously used for (a) the kind of rough-cast made by mixing small pebbles with cement and dinging or dashing it on with a trowel or shovel-shaped piece of wood; (b) in Scotland it is a word derived from the Scotch word "dinge," to dent, signifying the operation of forcing the mortar into joints of brickwork by means of a curved tool, or, as we call it in England, rule-, V- or beaded-jointing; (c) axing bricks to look like new; (d) rubbing the face of brickwork with a piece of coloured brick in order to give a uniform tint, generally before tuck-pointing; (e) a rough internal plastering in one coat pointed or ruled in to imitate brickwork, not necessarily following the actual joints. If the brickwork is fairly level the mortar may be laid on and then rubbed in with a piece of sacking, but if the bricks are rough the dinging must be more elaborate. For fuller details see paragraphs on p. 189 of our issue for November 4th, p. 205 of issue for November 11th, and p. 225 of issue for November 25th, 1903.

Adjoining Owners and Footings.

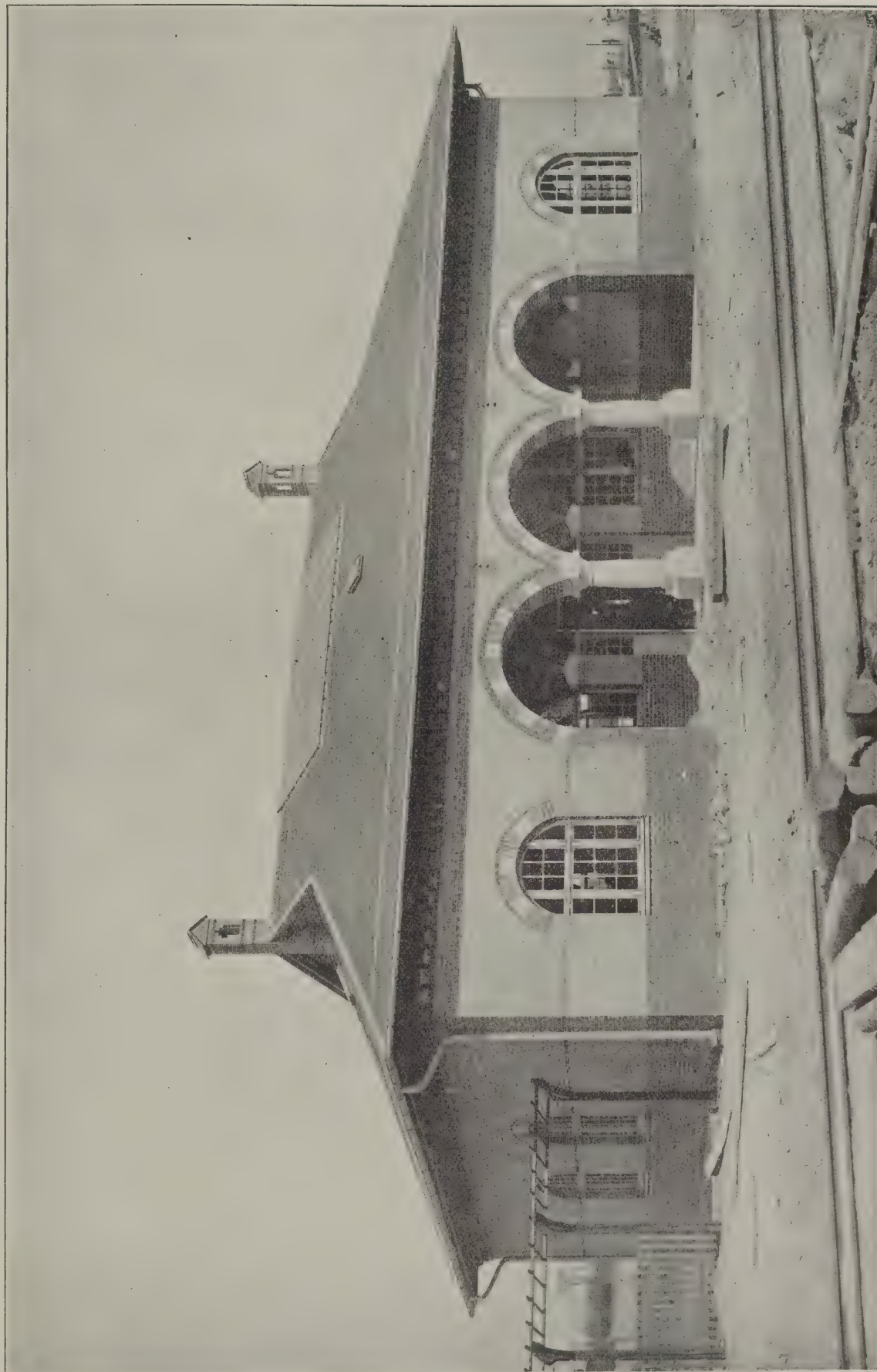
ILFORD.—F. F. F. writes: "There are two plots of ground. On one plot B builds a house with cellars. Therefore, the footings go down 6ft. or 7ft., and project 17ins. on A's ground, and in digging for same B has made a trench on A's ground about 5ft. wide at the top and about 2ft. at the bottom. A sells his plot, and the purchaser wishes to build his wall tight up against B's, but in doing so has, according to by-laws, to fill up the trench with concrete in order to form firm foundation for the footings, which only go down a foot or two, there being no cellar. Is the purchaser of A's plot required to excavate the made ground from trench (filled in by B) and to fill up with concrete at his own expense, or can he make B pay in any way?"

B ought, perhaps, to pay for the extra amount of concrete, but the matter is so small that it is not worth fighting about. After all, you have saved the cost of opening and filling in on B's land by reason of his footings having been built first.

Extras and Time-penalty Clause.

WILTS.—J. writes: "A certain job has taken longer than the period agreed to. There was a penalty clause in the agreement. The architect, however, altered the work as soon as the job began, namely, he required a brick plinth to be erected, and he altered the style of the brickwork from three courses of stretchers and one of headers to a header and stretcher work alternately, or Flemish bond. Red tiles were specified for the roofs, but after between 3,000 and 4,000 had been delivered on the site the architect asked for dun-colour tiles, which cost a good deal more. The construction of the roofs and one internal doorway was altered. Money has been detained for excavating which was not shown on the plans nor in the specification, and also the penalty for delay. What is the best course to take to enforce payment?"

It appears that you are entitled to receive payment for extras and also a time allowance; the architect ought to have given you due consideration, and if he refuses you should sue the client and him.



A NEW DANISH RAILWAY STATION. A. MELDAHL, ARCHITECT.

This new station on the Danish State Railway at Rungsted, Estre, comprises a central hall with a waiting-room to the left and luggage office to the right, with booking-office and station offices behind.

CHEAP COTTAGES EXHIBITION AWARDS.

THE judges appointed by the Committee of Organization of the Cheap Cottages Exhibition at Letchworth (Garden City) have made their awards as below. With two or three exceptions all the prize cottages have been illustrated in our columns, and the dates in brackets are those of the issues containing the illustrations.

The judges were Miss Octavia Hill, Prof. W. R. Lethaby, Mr. J. C. McCowan, Mr. R. Weir Schultz, Mr. Thackeray Turner, Prof. G. Sims Woodhead, and Miss Harriot Yorke.

It will be seen that they confirm the criticisms we made on the cottages.

Judges' Report.

In submitting our report we have to congratulate the promoters of the exhibition on the admirable response to their appeal. While a great deal remains to be done before the problem of rural housing can be considered as efficiently solved, we cannot help feeling that the collection of cheap cottages here brought together will help to achieve results which must be of immense service towards the end of obtaining suitable cheap cottages for the country labourer and artisan.

The site of the Garden City is particularly well chosen for economical building. Brick and sand are both cheap, lime is also moderate in price, and ballast and sand can be procured on the spot for the cost of digging and carting. The site is also within a comparatively short railway journey of some of the principal timber ports; timber for carpenters' work can therefore be delivered on the ground at a reasonable price.

The Cheapness of Bricks and Cement makes it possible here to erect substantial cottages at a price which will compare favourably with that of either timber-built houses of the same accommodation or of houses constructed of the various patent slabs or other processes, many of which are represented at the exhibition. We wish, therefore, to point out that, while the cost of the timber- or slate-built houses may be considered normal, the cost of the brick or cement-built houses is distinctly low—much less than it would be in many other districts where the price of such materials as brick, cement, sand, ballast, &c., rules higher. These facts must be taken into account and allowed for by the large section of the public who are visiting the exhibition, and who may otherwise be led astray somewhat by the prices attached in the catalogue to the various exhibits. We also desire to record our opinion that many of the competitors do not appear to have realized the problem put before them, and that a number of the buildings erected are not real cottages in the sense that they are suitable for the housing of a labourer or artisan and his family in the country, but may be more properly classed under the definition of pleasure cottages.

Opinion on New Methods of Building employed.

Some of the novel methods of building employed, while in many cases ingenious and economical, have not been sufficiently tested by time, and it is almost impossible to say whether they can yet be considered entirely reliable or suitable for permanent dwellings where the economical expenditure in upkeep has to be carefully kept in view. We cannot help feeling that

A Little More Ingenuity

might have been shown generally by competitors in overcoming customary defects or limitations, and in considering essential

details which make the difference between comfort and discomfort, and help towards a general higher level of healthiness. To instance only the important subject of ventilation, this seems to have received very little attention. The heads of the windows are usually some distance below the ceiling—in many cases between 2ft. or 3ft. This is undesirable from the point of view of efficient ventilation. There are hardly any cottages with double-hung sash-windows, and the ordinary hinged casement opening outwards, which has been almost generally adopted, has obvious limitations from this point of view, especially in single-storey cottages and in ground-floor rooms of two-storey cottages. Few cottages have windows divided horizontally by transoms with the upper lights hinged at top to push out, a suitable form of ventilation giving greater security than the ordinary side-hung window against rough weather and against easy access from the outside. No simple fastening has been exhibited which would allow of a window, say, on the ground floor being left slightly open without the possibility of anyone from outside opening it further in order to get access to a cottage in the occupiers' absence or during the night.

Other Points

need consideration, although we recognise that they are not all attainable in the cheapest class of cottages. The following are a few:—

1. The question of the copper. This necessary fitting is almost invariably placed in the scullery, and in a very few cases only has any provision been made for getting rid of the steam which in the ordinary way would fill the scullery and spread over the cottage. The more desirable place for the copper would be in an attached outhouse, as in exhibit No. 35; even to place it under a lean-to roof at the back of the cottage would be better than in the scullery.

2. Efficient provision for taking away the fumes of the cooking range. Each range should have direct means of ventilation.

3. The importance of having a small fire in the scullery which could be used only for cooking in hot weather, when a fire in the living-room would be otherwise unnecessary.

4. The construction of the fireplaces so as to allow of their giving the maximum of

heat with the minimum expenditure in fuel for cooking and heating purposes.

5. The desirability of having the chimneys within the building so as to economize heat.

6. The mitigation of variations of temperature, as in roof bedrooms, which are generally hot in summer and cold in winter.

7. The position of the e.c. This is often placed in close proximity to the larder—not a desirable position.

8. The advisability of having intercommunicating rooms to allow of supervision in the case of young children or of sickness.

9. Simplicity in roofing and the avoidance of valleys and excrescences generally.

We have paid a succession of visits to the exhibition, and have given our most careful attention to all the entries under the various classes. In submitting the following list of awards we have kept in view the conditions placed before the competitors—namely, relation of cost to appearance, accommodation, comfort, durability, fittings, suitability of material, and efficient workmanship.

Cottages.

CLASS I.—Cottages to cost not more than £150.

First Prize, £100.—No. 14. Messrs. Green Brothers, Whittington, near Chesterfield. Architect, Mr. Percy Houfton, Furnival Chambers, Chesterfield. (August 9th, p. 75.)

This cottage most nearly meets all the conditions. We have satisfied ourselves that it has been built for the sum of £150. The chief point against it is that the chimneys are in the outer walls. It will require a minimum of expenditure in upkeep. The walls are of brick, cement rough-cast on face. The roof is simple in form. The window stays and fastenings, the door-hinges and latches, and the fireplaces are especially commended. The following are some minor defects which are capable of being easily remedied:—The bedroom window heads are too far down from the ceiling. The larder opens out from the scullery. There is no provision for taking away the steam from the copper. The third bedroom has no fireplace, although one side abuts on a chimney. The stair window does not open.

Second Prize, £50.—No. 23. Messrs. Bennett & Bidwell, Letchworth.

This cottage is less substantial and the roof is not so simple. Minor defects:—There is no ventilation to copper. The larder wall is too slight. The outer scullery door is immediately opposite to the door of the living-room. The living-room fireplace is too near to the scullery door. There is a 9in. brick outside wall to the two most exposed faces of the living-room.

Third Prize, £25.—No. 35. Messrs. Potter & Co., 66, Victoria Street, S.W. (August 9th p. 79.)

This is a one-storey cottagē. It is built of concrete, rough-cast on external face and plastered on internal. The chimneys are in the centre. The roof is simple in form. The washhouse with copper is outside. We suggest that the front and back bedrooms might with advantage have a door of communication so that in the case of children they might be under direct supervision.

Prizes for wooden cottages: a wooden cottage being considered to be one built of timber between the roof and the foundations:—

First Prize, £50.—No. 80. F. W. Troup, 14, Gray's Inn Square, W.C. (August 2nd, p. 62.)

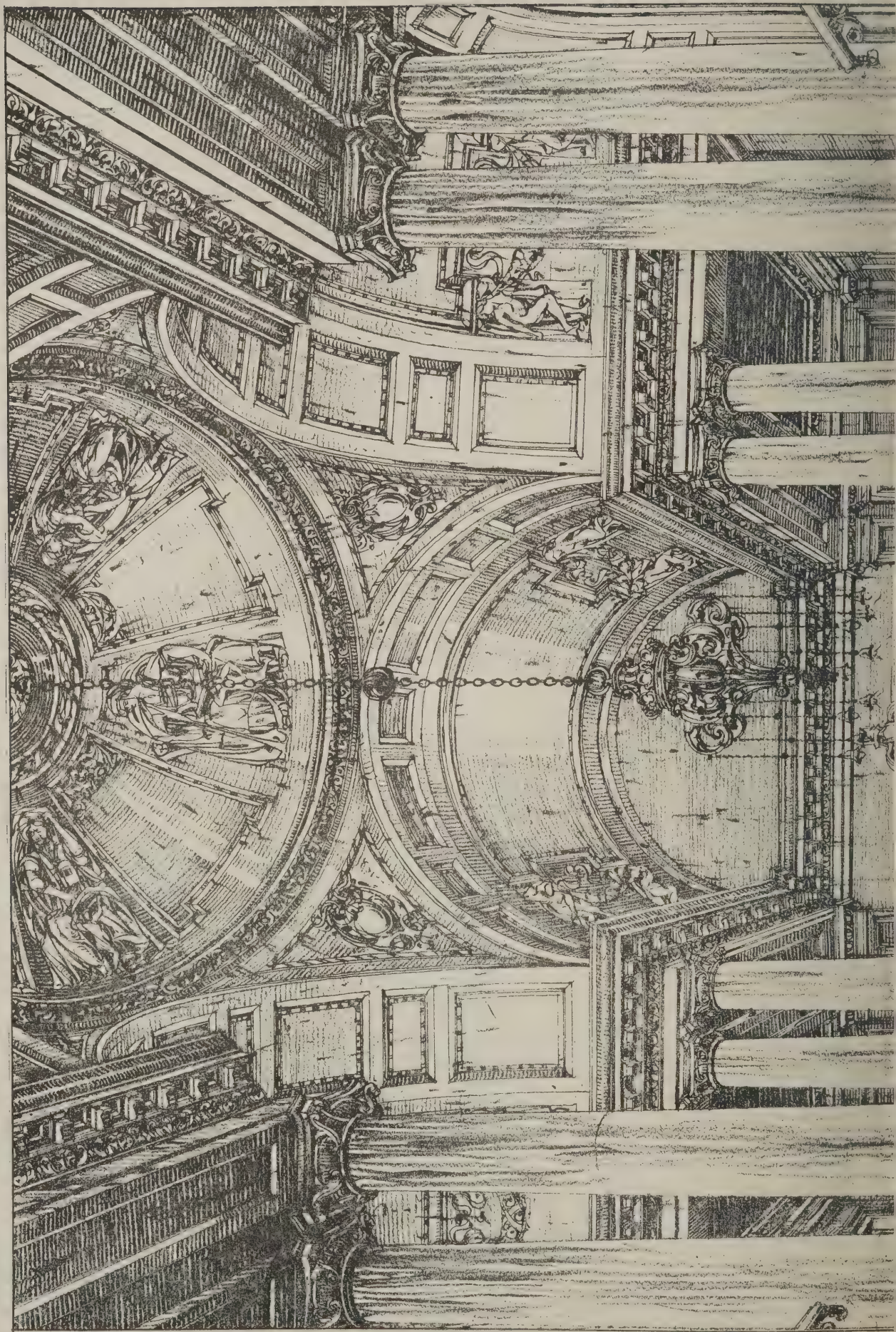
This is a good type. The chimneys are in the centre and the roof is simple in form. The principal objection to the cottage is that two of the rooms are entirely in the roof. There is a good and easy staircase. There is a fireplace in each bedroom. The copper has a hood for carrying away the steam. Minor defects:—The entrance door faces the east, and has no porch or efficient

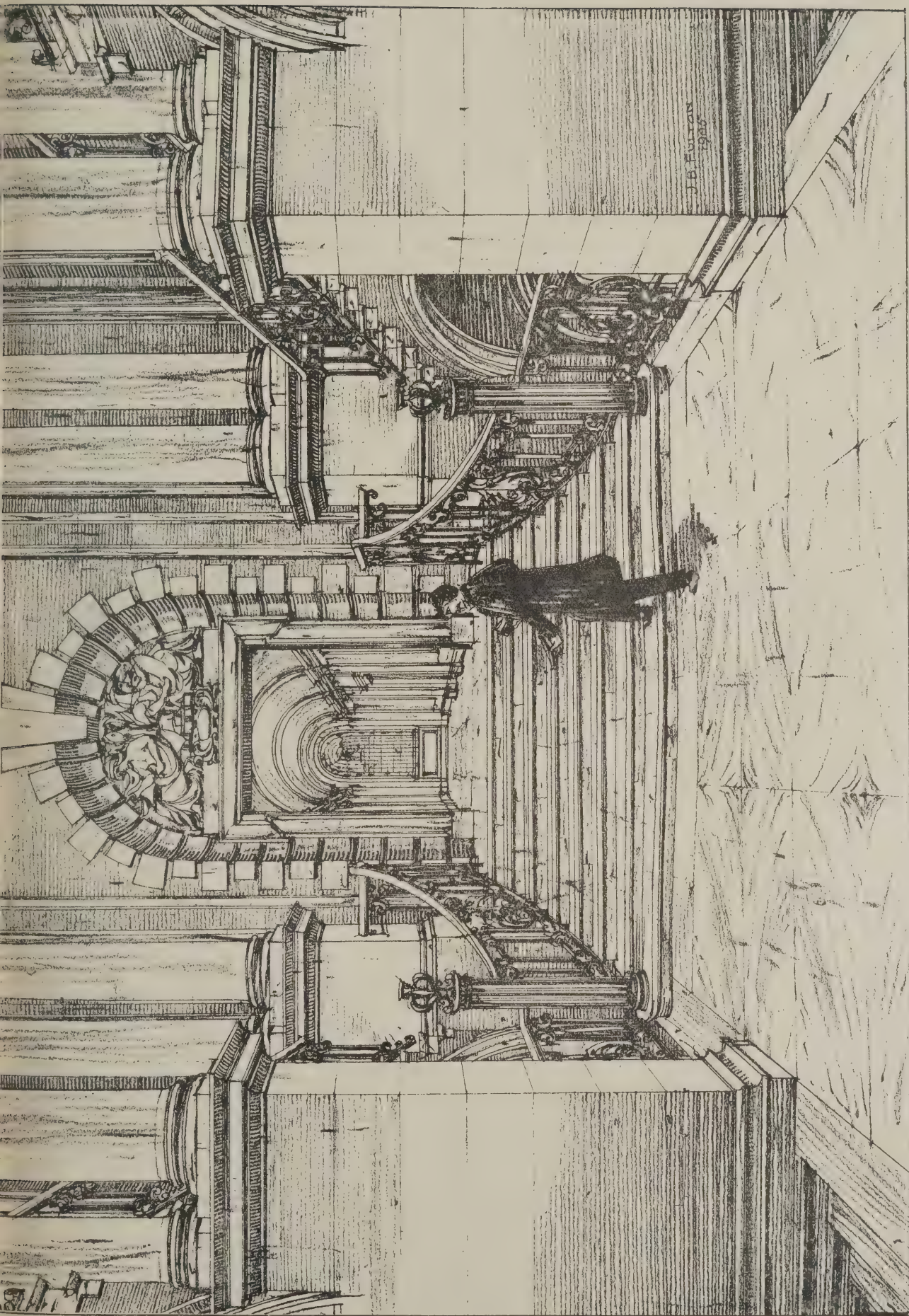


ERECTING CONCRETE SLAB COTTAGE AT LETCHWORTH (GARDEN CITY).

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*Supplement to
THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD,
Wednesday, September 20th, 1905.*





GRAND STAIRCASE MUNICIPAL BUILDINGS, WALSALL.

J. S. GIBSON, F.R.I.B.A., ARCHITECT.

(Royal Academy Exhibition, 1905.)

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OF THE
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protection. The e.c. is next the larder. There are thin boarded partitions between living-room and bedroom and between the staircase and upper bedrooms. The fireplaces are too close to doors. In upper rooms the window-heads are too far below the ceiling. There is no comfortable corner by the living-room fire, there being doors on both sides.

Second Prize, £25.—No. 81. Messrs. Smith & Brewer, 2, Gray's Inn Square, W.C.

This cottage has a good living-room. There is a good ventilated copper in the scullery. The stair is steep. The e.c. is next the larder. The living-room range looks inadequate.

CLASS 2.—For the best pair of five-roomed cottages (including scullery or kitchen scullery) erected at a cost not to exceed £300.

First Prize, £50.—No. 35. Messrs. Potter & Co., 66, Victoria Street, Westminster. (August 9th, p. 79.)

The remarks on the single cottage in Class I. apply to this pair also. The form of construction is novel.

Second Prize, £30.—No. 70. A. H. Clough, Burley, Ringwood.

In connection with this pair of cottages it may be pointed out that the form of the roof adopted is not desirable, unless required to meet the limitations of too stringent by-laws. Upright studding, weather-tiled on face, would conform to the by-laws in this district, would give better rooms, cramp the doors less, and be as economical a form of building as that carried out.

Third Prize, £20.—No. 67. The Copartnership Tenants' Housing Council, 22, Red Lion Square, W.C. (August 9th, p. 78.)

We suggest that a bay window is not required in a living-room of this size, that it is more costly than an ordinary window, and without compensating advantage as here placed. A simpler form of roof might be adopted over the central part of the building. The arrangement of the plan is rather wasteful of space.

Honourable Mention.—No. 32. Mr. G. P. Gooch and Mr. Curtis Green.

This is commended as a good simple type of cottage, but, as carried out, has defects of construction.

CLASS 3.—For the best group of three or four cottages, no one cottage to contain more than six rooms, including scullery, and erected at a cost not to exceed £35 per room.

Prize of £25 to No. 01, Mr. Geoffrey Lucas, A.R.I.B.A., 2, Vernon Place, Bloomsbury Square, W.C., and 23, Brand Street, Hitchin, Herts. (August 2nd, p. 59.)

We think that, for the price stated, better cottages could be constructed.

CLASS 4.—For the best detached cottage, or pair of cottages, each containing not more than six rooms, including scullery, and erected at a cost not to exceed £35 per room.

Prize of £100 to No. 79, Mr. A. Randall Wells, 25, Cornwallis Gardens, Hastings. (August 2nd, p. 62.)

This cottage has cost more than £150, but we consider it good value for the actual cost, £170. We suggest that the walls might with advantage be rough-cast outside; also that the partition between the central bedroom and lobby on first floor might, in many cases, be omitted, thus giving two intercommunicating rooms for parents and young children. The rooms are large and the offices are spacious. The chimneys are in inside walls. The plan is very well thought out. The fittings are simple and inexpensive. The sizes of the rooms generally may be thought to be on the large side, keeping in view the cost of warming in cold weather, and also the additional initial cost of building.

In addition the following prizes have been awarded:—

Prize of £100, offered by an anonymous donor, for the cheapest cottage for value given:—

No. 71. Mr. A. H. Clough, Burley, Ringwood.

This cottage contains the minimum of accommodation for a labourer and his family, viz., a living-room, scullery, larder, outhouses and three bedrooms. It is simple in form, is compactly arranged, and has been erected at a cost of £120.

Prize of £50, offered by the Associated Portland Cement Manufacturers (1900), Ltd., for the best cottage built of cement-concrete. No conditions were made by the donors in regard to the cost of the cottage, and the prize has been awarded under these special circumstances:—

No. 58. The Concrete Machinery Co., 18, Water Street, Liverpool. Architect, Mr. Gilbert Fraser. (August 2nd, p. 60.)

The method of construction, if found to be permanent, seems to be economical. The imitation of stone is to be deprecated.

Designs.

Prizes were also offered, and have been awarded, for the best designs of cottages, &c., on the same lines as the cottages themselves. These prizes have been awarded as follows:—

Class 1:—

First Prize, £10.—Messrs. Bennett & Bidwell, Letchworth.

Second Prize, £5.—Mr. W. A. T. Carter, 15, Waldemar Road, Wimbledon.

Class 2:—

First Prize, £10.—Mr. W. R. Mosley, 146, High Street, Slough.

Second Prize, £5.—Mr. W. Marshall, Hatfield.

Class 3:—

First Prize, £10.—Mr. Lionel F. Crane, Old House, Holland Street, Kensington.

Class 4:—

£10.—Mr. Geoffrey Lucas, A.R.I.B.A.

The special prize of £10 offered by Mr. H. G. Elwes, F.R.S., for the best design and specification of a wooden cottage, to be constructed entirely of English timber, has been awarded to the design submitted conjointly by Mr. Detmar Blow, of 9, King's Bench Walk, Temple, and Mr. Ernest Gimson, of Daneway House, Sapperton, Glos.

Accessories.

The following are commended:—

Wire bitumen damp-course by Vickers & Field, 6, Eldon Street, E.C.

Paving by Excelsior Patent Stone Co., Finedon Sidings, Northampton.

Ruberoid roofing (for temporary buildings) by Robert Blackwell & Co., 59, City Road, E.C.

Crane-rod casements (for their usefulness and ingenuity, although hardly coming within the margin of cost of a cheap cottage) by R. Whitbread, Carlton, near Nottingham.

Elkay & Cornes, Ltd.'s model cottage range, with copper combined (this also may perhaps hardly be considered as coming within the margin of cost of a cheap cottage).

The "Ideal" independent copper, with cover and steam exhaust, by Clark, Hunt & Co., 159-160, Shoreditch, E. (This copper is exhibited by several makers.)

Fred. Betts, Ltd.—range and oven in cottages Nos. 69-71.

Edwards's copper and hood in cottage No. 81.

The awards were delivered at Letchworth on Saturday before a large gathering.

After reading the report, Mr. J. St. Loe Strachey remarked that there had already been over 20,000 visitors to the exhibition, and a surplus of £150 was expected. It was intended with this sum to commission the winner of the first prize to erect another cottage embodying the suggestions of the

judges, so that it would remain as a model of what they considered a £150 cottage should be. It would be handed over to the Garden City, and would be kept as a museum for the designs that had been collected and other records of the exhibition, and it would be always accessible as a store-house of information to those who wished to study the question of cheap cottage building.

On Saturday afternoon a conference on housing was held. Alderman W. Thompson (chairman of the National Housing Reform Council), who occupied the chair, said he had derived from the exhibition the impression that the square plan of building under one roof, with the avoidance of additions, gave the minimum of wall-space and the maximum of area. He thought that most of the patent materials were more costly than bricks, and suggested that detailed particulars should be supplied showing the exact cost of labour and construction in each cottage as an indication where to look for economies. It was also important to state where the cottages infringed local by-laws. They were built under the by-laws of Hitchin, whose model code should be followed all over the country.

We give on the opposite page a photograph showing the erection of the concrete slab cottage designed by Mr. J. A. Brodie, M.I.C.E., city engineer of Liverpool. Plans and elevations of the cottage were given on p. 64 of our issue for August 2nd. Mr. Brodie has had some experience of the erection of such cottages as this one at Letchworth, having built several on the same lines at Liverpool, but one cannot help observing that, however cheap the work of erection might be when a dozen cottages were concerned, in this particular instance the scaffold with its traveller looks as if it would cost almost as much as the cottage! We are indebted to the "County Gentleman" for the illustration.

OUR PLATE.

THE new municipal buildings at Walsall are to be opened at the end of this month. The staircase is a great feature of the interior. The walls are finished in plaster and painted, while the decorative work is executed in Bath stone. The columns and the floor are of Sicilian marble and the ceiling of fibrous plaster by Mr. Gilbert Seale. The staircase is lighted by two stained-glass windows designed by Mr. Garth Jones and executed by Messrs. Abbott & Co., of Lancaster. The general contractors for the new building are Messrs. Armitage & Hodgson, of Leeds, the architect being Mr. James S. Gibson, F.R.I.B.A., of London.

Change of Address.—Mr. Herbert Goodman, A.R.I.B.A., has removed his offices from Walthamstow to Cranfield, Woodford Green.

The Royal Naval College at Dartmouth, the foundation-stone of which was laid by the King four years ago, was opened on Thursday last without formal ceremony. It has been erected at a cost of £300,000 from designs by Sir Aston Webb and Mr. E. Ingress Bell.

The Northampton Institute.—The book of "announcements" for the session 1905-06 has just been issued. The classes of the day courses commence on Monday, October 2nd, and those of the evening courses on Monday, September 25th. Full details of the syllabuses and the equipment are given.

Architectural Classes at King's College.—The various classes, day and evening, in the division of architecture at King's College, London, will begin during the first week of October. The curriculum recommended by the Board of Architectural Education has been adopted. A detailed prospectus can be had on application to the secretary at King's College, Strand.



BOILER SHOP OF MESSRS. MARSHALL, SONS & CO. LTD., AT GAINSBOROUGH. GLAZED ON MELLOWES' "ECLIPSE" SYSTEM.

Trade and Craft.

Glazing.

We have received a copy of a new catalogue just issued by Messrs. Mellowes & Co., Ltd., of Corporation Street, Sheffield, and 28, Victoria Street, Westminster, which should be extremely interesting and useful to architects, engineers and others. This firm's patent system of glazing for roofs, the "Eclipse," has now become such a standard thing in construction that its application in various positions and to various conditions is interesting to every professional man. The catalogue is well got-up and printed, and the illustrations are both impressive and instructive. We reproduce on this page one illustration showing the advantages of the "Eclipse" system for glazing large roofs, with its lightness, clearness and grace, and its particular fitness to jobs such as the huge engineering works of Messrs. Marshall, Sons & Co., Ltd., at Gainsborough. Among the other illustrations in the catalogue of work executed by Messrs. Mellowes are the Crystal Palace, Leeds electricity station, Birmingham Railway Carriage and Wagon Co.'s works at Smethwick, Vickers, Sons & Maxim's works at Sheffield, Cadeby Colliery, Yorks, slipway at Wallsend, Midland Arcades at Birmingham, and railway stations at Blackpool, Carlisle, Cheadle Heath, Edinburgh, Nottingham, Wemyss Bay, and Marylebone, Euston, King's Cross, London Bridge and Waterloo Junction in London—a convincing list.

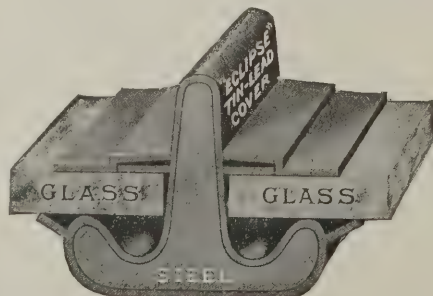
There are a number of systems of glazing on the market, many of which are inefficient and very unsatisfactory after a few years. This is partially due either to the shape of the glazing bars or the materials of which they are constructed; zinc is a perishable material especially, while, as to shape, gutters may be blocked up and provision is seldom

made for condensation. In the "Eclipse" system the whole of the exposed parts are made of tin and lead, and after an experience of twenty-three years with the system in Sheffield, Woolwich and Manchester—towns in which the air is as destructive as could well be found—the bars are found to have been unaffected by atmospheric action. We publish below a section showing the form of the "Eclipse" glazing bars and the means by which water, dirt and dust are kept out. The bar will be seen to have three webs, which, unlike either copper or zinc, can be rubbed firmly against the glass. There are two webs above and one below, and great importance is placed on the smaller of the two top webs and on the one underneath. The steel bar gives the necessary strength and allows large spans to be covered, while it is prevented from rusting by a strong tin-lead metal cover which is soldered at both ends. There is no possibility of the glass being broken by expansion or contraction, and allowance is made for condensation to escape to the outside of the roof. The "Eclipse" system is easily applicable to hip roofs, domes and vertical or window glazing. One feature of the system is that, steel being used instead of wood, the size of bars is greatly reduced and more light

is transmitted into the interior of a building. The glass most frequently used is rough-cast plate. There are several sections of bars used, the particular one being determined by the length of the pane required. We illustrate No. 7 section, which is used for lengths up to 6ft 6ins. between bearings; No. 10 section can be used up to 11ft. The "Eclipse" metal cover can be adapted to suit the top part of a wooden bar, leaving only the underneath part exposed to the inside of the building (the steel is of course omitted in this case). The lead flashings generally used are of 5 lb. lead for ridges, bottom rails, valleys, hips and stiles, and 4 lb. lead for purlins. It is important to note that Messrs. Mellowes & Co. will guarantee to maintain any roof glazed on their system for a term of years.

Artistic Mantelpieces.

On more than one occasion we have remarked upon the great improvement in the design of mantelpieces and other woodwork shown in makers' catalogues; this improvement being generally associated with a reversion from the degraded cast-iron types of the Victorian era and the adoption of wood models treated with restraint and taste. A number of designs for such mantelpieces are given in the new catalogue which has been sent to us by Messrs. Crosby & Co., of Farnham, and we can confidently recommend readers to obtain a copy for themselves. The firm make a feature of this work, and have also introduced the "log back" fire on hearth to burn coke, coal or wood, the "log back" being in one piece of fireclay and adapted to almost any room at very nominal expense. It is made in sizes from 12ins. to 24ins. wide by 30ins. and 36ins. high, with straight, circular or octagonal front, and can be supplied with any kind of tiles to suit surrounds and hearth.



Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberdare.—For the erection of twenty houses on the site of Abergwawr Brewery, for Mr. and Mrs. Taliesin James. Mr. Aneurin T. James, architect and surveyor, Hawthorne House, Gloucester Terrace, Aberdare:—

W. E. Willis, Pentre...	£3,750	0	0
J. D. Wilkins, Abermant...	3,670	0	0
Mills Brothers,* John Street, Cardiff...	3,480	0	0
A. Richards, Pentre (per house)...	187	10	0

* Accepted.

† Allowing for materials. † Allowing for materials, and also bathroom, &c., in addition.

Cottingham (Hull).—For the erection of a residence, for Mr. R. Kitching. Mr. T. Brownlow Thompson, architect, 15, Parliament Street, Hull:—

Marsden & Son	£1,600	0	0
G. W. Richardson	1,592	0	0
J. Wilson...	1,585	0	0
E. Good & Son	1,557	10	0
G. H. Pantou...	1,575	0	0
Hockney & Ligins	1,549	0	0
Pape & Son, Beverley	1,546	0	0
J. Thompson & Son	1,543	17	9
M. Harper	1,543	14	0
Amalgamated Builders	1,540	0	0
J. T. Levitt	1,520	0	0
Bowman & Son	1,496	0	0
Southern's Exors.	1,480	10	0
J. Houlton & Son	1,480	0	0
G. W. Berridge	1,471	7	0
H. T. Arnott	1,470	17	0
F. Bilton	1,456	0	0
H. Hunt	1,455	17	3
G. Houlton	1,450	0	0
W. Turner	1,446	10	0
J. T. Windass...	1,416	13	0
J. H. Wright, Cottingham	1,415	13	9
T. Goates...	1,393	0	0
J. R. Woods	1,372	0	0
Hills & Stephenson	1,377	2	5
H. Kaye	1,367	0	0
J. Carr & others,* Cholmley Street, Hull	1,055	18	4

* Accepted. [Rest of Hull.]

Breachwood Green, Welwyn (Herts).—For alterations and repairs to cottages and shop premises. Mr. S. Doddimeade Edmunds, M.S.A., architect and surveyor, Victoria Street, St. Albans:—

S. Wilson & Son, Breachwood Green...	£175	0	0
J. Saunders & Son, Luton	185	0	0
T. Wood & Sons, Luton	194	12	0

Faversham.—For the erection of schools for 900 children, for the Education Committee. Mr. W. L. Grant, architect. Quantities by architect:—

Cornelius & Son	£15,590	0	0
Whiting Brothers	15,355	0	0
G. Browning...	14,995	0	0
G. Wallis & Sons	14,967	0	0
W. J. Adcock	14,923	0	0
Gann & Co.	14,844	0	0
Hayward & Paramor	14,749	0	0
Wise	14,475	0	0
G. Bowes	14,325	0	0
Ratcliffe Brothers	14,050	0	0
T. Monk...	14,031	3	9
J. T. May	14,000	0	0
W. Judges	13,938	0	0
G. H. Pettmann	13,834	0	0
Fuller & Reeve	13,750	0	0
A. S. Ingleton,* Herne Bay	13,583	15	7

* Accepted.

Gloucester.—For the extension of George Street branch post-office, for H.M. Office of Works, &c.:—

R. Wilkins & Sons...	£4,689	£171	
A. King & Sons	4,582	200	
A. E. Denby & Co.	3,900	150	
J. Gurney	3,700	180	
J. Byard & Sons	3,465	210	
A. Estcourt & Sons...	3,447	147	

W. E. Blake	£3,445	£135	
W. Jones	3,350	130	
A. S. Cooke	3,260	145	
A. J. Colborne	3,189	215	
W. Bowers & Co.	2,950	116	

Grimsby.—Accepted for the erection of a Sunday school and internal alterations to the Zion Baptist Church, Freeman Street, Grimsby. Messrs. Garside & Pennington, architects, Ropergate, Pontefract, and Central Chambers, Castleford:—

Henings & Goodhand, Grimsby ... £1,377
Hendon.—For the completion of a building on the Collindale Estate, for Mr. Abraham Booth. Mr. S. Doddimeade Edmunds, M.S.A., architect and surveyor, St. Albans:—

W. H. Holden & Co., Reading	£480		
G. Jaggard, Bushey	414		

Llanhilleth.—For the erection of a Wesleyan church, &c., for the Trustees. Mr. Wyndham Moses, architect, Clifton House, Risca:—

J. Jenkins, Ltd. Newport	£1,500		
B. Lewis,* Aberbeeg	1,362		
J. J. Partridge, Newport	1,343		
N. Bagley, Abertillery	1,326		

* Accepted.

London, S.W.—For the erection of a boiler-house, cable-shed and stores at the electricity works, Townmead Road, for the Fulham Borough Council:—

W. J. Fryer & Co.	£5,190	0	0
H. Windsor & Co.	5,083	7	2
Leslie & Co.	4,495	0	0
F. & G. Foster	4,278	0	0
Perry & Co.	4,656	0	0
Higgs & Outhwaite	4,613	0	0
A. Lawrence & Son	4,545	0	0
S. E. Moss & Co.	4,300	0	0
B. E. Nightingale	4,077	0	0
W. H. Hyde	3,810	0	0
A. Hudson & Co.	3,550	0	0

[Borough surveyor's estimate, £4,000 (recommended for acceptance).]

Mill Hill.—For the erection of two villa residences in Hendon Wood Lane, for Mr. C. G. Bowyer and Mr. S. Nadale. Mr. S. Doddimeade Edmunds, M.S.A., architect and surveyor, Victoria Street, St. Albans:—

Pearson & Son, Barnet	£1,475	0	0
J. Christie, London	1,182	10	0
W. Toot, Hendon	1,145	0	0
H. Phillips, Mill Hill	1,140	0	0
W. Goodchild & Son, St. Albans	987	19	0

Penygraig.—Accepted for additions, alterations and renovation to Pishag C.M. Chapel, Penygraig. Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tynyandy:—

E. Jones, Cwmparc, Treorky, South Wales	£1,741	9	0
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Sheffield.—For the erection of a new infant school for 400 children, together with a cookery-room, manual instruction workshop and caretaker's house in Daniel Hill Street, Uppertorpe, for the Education Committee. Mr. H. L. Paterson, A.R.I.B.A., architect, 19, St. James's Street, Sheffield:—

J. W. Winter, Handsworth	£10,393	10	0
A. Moore	9,888	0	0
Ash, Son & Biggin	9,100	0	0
W. & A. Forsdike	9,100	0	0
W. R. Unwin, Ecclesfield	8,920	0	0
Fidler & Sons	8,800	0	0
Boot & Sons	8,775	0	0
E. & W. Oxley	8,735	0	0
Wellerman Brothers, Hyde	8,715	0	0
S. Bool, Intake	8,705	0	0
Kee & Kirk, Chesterfield	8,675	0	0
Longden & Son	8,650	0	0
J. White & Son	8,620	0	0
J. & H. Wheen	8,556	0	0
J. & T. Robertson	8,461	10	0
H. Freckingham	8,400	0	0
Dawson & Jones	8,397	10	0
O'Neill & Son	8,381	0	0
Hollingworth & Bedford	8,339	0	0
H. Turton	8,325	0	0
T. Roper	8,269	0	0
Wilkinson & Sons	8,250	0	0
Eschley & Sons*	8,083	0	0

* Accepted.

Sheffield.—For the erection of a training-college hostel, Collegiate Crescent. Messrs. Gibbs & Flockton, architect, 15, St. James's Row, Sheffield:—

Armitage & Hodgson	£11,869	0	0
W. Moss & Son	11,550	0	0

J. T. Wright...	£11,454	0	0
G. Carr	11,000	0	0
J. Eschley & Son...	10,925	0	0
Dyson & Son...	10,914	10	0
T. Lowe & Sons	10,790	0	0
H. Turton	10,615	0	0
W. & A. Forsdike	10,580	0	0
T. & H. Wheen	10,580	0	0
G. Longden & Son	10,497	11	0
J. Fidler, Ltd.	10,350	0	0
J. Wilkinson & Sons	10,350	0	0
Ash, Son & Biggin	10,260	0	0
H. Brumby & Son	10,255	0	0
Dawson, Jones & Co.	10,209	10	6
J. Mastin & Son	10,175	0	0
H. Boot & Son	10,160	0	0
D. O'Neill & Son	9,962	0	0
T. Roper & Son,* Sheffield	9,905	0	0

* Accepted.

St. Albans.—Accepted for the erection of a detached residence, No. 1, Clarence Road, for Mr. A. J. L. Gliddon. Mr. S. Doddimeade Edmunds, M.S.A., architect, St. Albans:—

Vail & Williamson, St. Albans...	£747		
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St. Albans.—For the erection of a detached residence, No. 2, Jennings Road, for Mr. A. J. L. Gliddon. Mr. S. Doddimeade Edmunds, M.S.A., architect, St. Albans:—

C. W. Dumpton, St. Albans	£986		
W. Goodchild & Son,* St. Albans	939		

* Modified and accepted.

St. Albans.—For the erection of a pair of villa residences, Blandford Road, for Mr. T. R. Yates. Mr. S. Doddimeade Edmunds, M.S.A., architect, St. Albans:—

Vail & Williamson	£939	0	0
W. Sharp	895	0	0
C. W. Dumpton	891	14	0
H. J. Skelton*	780	0	0

* Accepted.

[All of St. Albans.]

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending September 15th nineteen failures in the building and timber trades in England and Wales were gazetted.

G. DAWSON, builder, Barton-on-Humber. Gross liabilities £1,206; deficiency £424.

D. BLOOM & SONS, builders, Liverpool. Liabilities £716; assets nil.

A. E. CLOUTMAN, builders' merchant, Bristol. Liabilities £1,068; assets £755.

J. SHATTOCK, builder, Newport. Liabilities £1,388; assets £10.

J. NORBURY, builder and contractor, Warrington. Adj. Sept. 9th.

J. ROWSELL, builder, South Petherton. P.E., Yeovil Town Hall, Oct. 5th, at 12.30.

J. MOLLEKIN, journeyman builder, Hull. P.E., Hull C.C., Oct. 23rd, at 2.

E. SLINGSBY, plumber, Halifax. P.E., Halifax C.C., Oct. 2nd, at 2.

G. H. UPTON, builder, Hull. P.E., Hull C.C., Oct. 23rd, at 2.

W. BOWEN, builder, Merthyr Tydfil. Gross liabilities £988; assets £11.

J. H. DODGSON, builder, Morecambe. Liabilities £895; assets £64.

G. MOORE & SON, builders, Wrexham. Liabilities £161; assets £119.

ARNOLD BELL & Co., builders, Bromley. Gross liabilities £10,834; estimated to rank for dividend £2,127; assets £975.

A. H. GLENISTER-JONES, builders' merchant, Sheffield. Liabilities £193; assets nil. P.E., Sheffield C.C., Oct. 5th, at 2.

C. W. GILLING, builder, Forest Gate and Sheerness. First meeting, London Bankruptcy Court, Sept. 22nd, at 11. P.E., same, Nov. 2nd, at 11.

J. SAVAGE, plumber, Ryde. First meeting, O.R.'s, Newport (Isle of Wight), Oct. 9th, at 1. P.E., Newport Town Hall, Oct. 9th, at 3.15.



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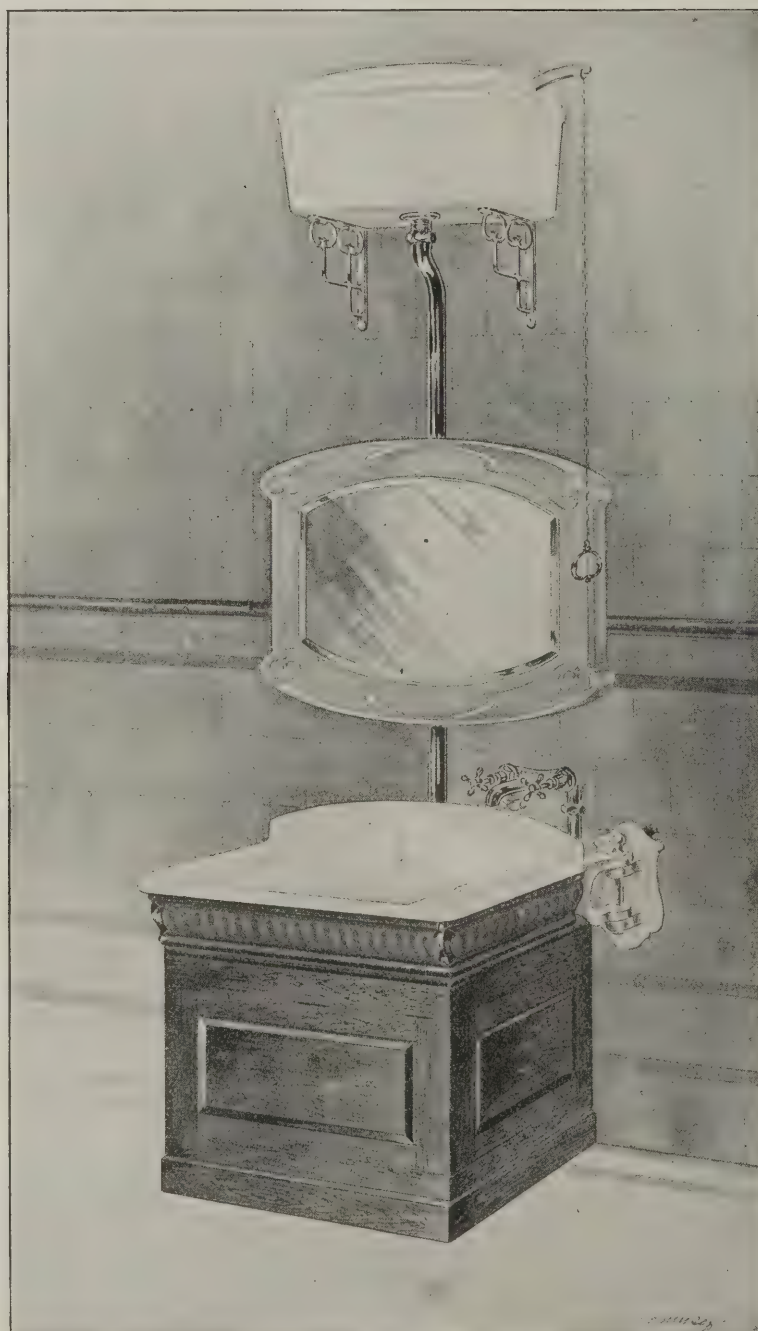
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Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
Sept. 21	Richmond—School	Town Council	F. B. Senior, Town Clerk, Richmond.
" 21	Langtoft—Alterations to School	Education Committee	Building Surveyor, Beverley.
" 21	Brantree—School	Education Committee	Chancellor & Son, Architects, Duke Street, Chelmsford.
" 22	Manchester—Sheds	Guardians	A. J. Murgatroyd, Architect, 23 Strutt Street, Manchester.
" 23	Truro—School Works	Education Committee	District Education Office, Truro.
" 23	Wakefield—Alterations to House	Council	City Surveyor, Town Hall, Wakefield.
" 23	Newlyn—School Works	Education Committee	District Education Office, Penzance.
" 23	Greenhithe—Foundations	Wallpaper Manufacturers, Ltd.	Wallpaper Manufacturers, Ltd., 11 Southampton Row, W.C.
" 23	Edinburgh—School	School Board	M. Carfrae, Architect, 3 Queen Street, Edinburgh.
" 23	Wrexham—Library	Town Council	V. Hodge, Architect, 13 Grand Parade, Teddington.
" 23	Barnstaple—School	Education Committee	G. W. F. Brown, The Square, Barnstaple.
" 23	Carmarthen—Repairs to Shire Hall	County Council	C. H. Mounsey, County Surveyor, Carmarthen.
" 23	Haverfordwest—Underpinning, &c.	Trustees	W. D. Caros, Architect, 8a Whitehall Place, London.
" 23	Barnet—Church House	Corporation	E. Dolton, 35 Wood Street, Barnet.
" 25	Folkestone—Convenience	Corporation	Borough Engineer, Corporation Offices, Folkestone.
" 25	Birmingham—Tramway Depot	County Council	G. Kenrick, Surveyor, 83 Colmore Row, Birmingham.
" 25	Brynamman—Wall	Urban District Council	W. J. Williams, Station Road, Brynamman.
" 25	Felling—Stables	Convalescent Home Committee	H. Miller, Council Buildings, Felling.
" 25	Hunstanton—Buildings	Corporation	A. P. MacAlister, F.R.I.B.A., 20 St. Andrew's Street, Cambridge.
" 25	West Hartlepool—Alteration to Stables	Urban District Council	Nelson F. Dennis, Borough Engineer, West Hartlepool.
" 26	Ilford—School	Education Committee	C. J. Dawson, Architect, 11 Cranbrook Road, Ilford.
" 26	Somersham, Ipswich—School Enlargement	Education Committee	G. W. Leighton, Architect, Princes Street, Ipswich.
" 26	Henley, Ipswich—House	County Council	G. W. Leighton, Architect, Princes Street, Ipswich.
" 26	London—Blocks of Buildings	Urban District Council	Superintending Architect's Department, 15 Pall Mall East, S.W.
" 26	Uxbridge—Water-tower	Guardians	F. S. Courtney, 25 Victoria Street, London, S.W.
" 26	London, W.C.—Repairs to Casual Wards	Corporation	Guardians' Offices, 27 Broad Street, London, W.C.
" 26	Keighley—Alterations to School	University College of Wales	W. H. Hopkinson, Borough Engineer, Keighley.
" 26	Aberystwyth—Laboratories	Corporation	A. W. S. Cross, Architect, 46 New Bond Street, London.
" 27	West Hartlepool—Shed	Guardians	Nelson F. Dennis, Borough Engineer, West Hartlepool.
" 27	Hendon—Lavatories	Urban District Council	Union Offices, Edgware.
" 27	Wood Green—Town Hall Additions	Committee of Foresters' Homes	C. J. Gunion, Engineer, Town Hall, Wood Green.
" 28	Bexley Heath—New Wing	Sanitary Committee	J. S. Paul & Son, 31 Bedford Row, W.C.
" 28	Halifax—Villas	Guardians	G. Buckley & Sons, Architects, Tower Chambers, Halifax.
" 29	Warrington—School	Urban District Council	S. P. Silcock, Architect, Egypt Street, Warrington.
" 29	Newcastle-upon-Tyne—Pavilions	H.M. Office of Works	City Property Surveyor's Depart., Town Hall, Newcastle-upon-Tyne.
" 29	Porth—Villas	Guardians	20 Cemetery Road, Porth, Wales.
" 30	Barrow-in-Furness—Cottage Homes	Urban District Council	H. T. Fowler, Architect, Cornwallis Street, Barrow-in-Furness.
" 30	Rhyl—Library	Education Committee	A. A. Goodall, Surveyor, Council Offices, Rhyl.
Oct. 4	Taunton—Schools	H.M. Office of Works	Bryan & Roberts, 2 Hammet Street, Taunton.
" 4	Harrogate—Post Office Enlargement	Guardians	H. G. Nixon, H.M. Office of Works, Infirmary Street, Leeds.
" 4	Homerton—Superstructure	Corporation	F. R. Coles, Clerk's Office, Hackney Union, Homerton, N.E.
" 7	Eastbourne—Fire Station	H.M. Office of Works	Borough Surveyor's Office, Town Hall, Eastbourne.
" 10	Blackfriars—Power Station	London County Council	J. Wagner, H.M. Office of Works, Westminster, S.W.
" 10	Twickenham—Repairs to Mansion	Education Committee	Architect's Department, 15 Pall Mall East, S.W.
" 16	Preston—School		Education Offices, Preston.
No date	Alltymynydd—Sanatorium		Architect, 4 Quay Street, Carmarthen.
"	Leeds—Schools		E. Simpson, Architect, 12 Cunliffe Terrace, Manningham, Bradford.
ENGINEERING:			
Sept. 21	Linton—Cleaning and Repairing Well	Parish Council	H. Simpkin, Linton, Burton-on-Trent.
" 21	Margate—Scrubber-washer	Gas Co.	F. A. Winstanby, Engineer and Manager, The Dane, Margate.
" 22	Manchester—Washing Machinery	Guardians	A. J. Murgatroyd, Architect, 23 Strutt Street, Manchester.
" 25	Sewree, Bombay—Pier	Bombay Port Trustees	Sir J. Wolfe Barry, 7 The Sanctuary, Westminster, S.W.
" 25	Bamford—Filters, &c.	Water Board	E. Sandeman, Engineer, Bamford, near Sheffield.
" 26	Upton-on-Severn—Well	Rural District Council	Willcox & Raikes, 63 Temple Row, Birmingham.
" 26	Bridgewater—Doors	Drainage Board	W. J. R. Poole, Clerk, 9 Dampier Street, Bridgewater.
" 26	Uxbridge—Tank, &c.	Urban District Council	F. S. Courtney, Engineer, 25 Victoria Street, Westminster, S.W.
" 27	Spring Vale—Earthwork, Bridge, &c.	Lancs & Yorks Railway Co.	Engineer's Office, Hunt's Bank, Manchester.
" 28	Tula, Roumania—Water-supply	Municipality	Municipal Offices, Tula.
Oct. 2	Westerham—Pumping-engine	Metropolitan Water Board	District Engineer, Brookmill Road, Deptford, S.E.
" 3	London, N.E.—Boilers	Metropolitan Asylums Board	Metropolitan Asylums Board, Embankment, E.C.
" 9	Liege—Extension of Water Conduit	County Council	A. Halleux, C.E., 74 rue Fabry, Liege.
" 10	London—Reconstruction of Bridges	Municipality	M. Fitzmaurice, Chief Engineer, County Hall, Spring Gardens, S.W.
" 10	Alexandria, Egypt—Quays		Director-General of Harbours and Lighthouses, Alexandria.
" 23	Mussoorie, India—Electric Lighting and Waterworks Scheme.		C. H. Shanahan, Municipal Office, Mussoorie, India.
Nov. 9	Havana—Pier		Cuban, Consulate London.
IRON AND STEEL:			
Sept. 21	Prestwich—Iron Railings	Guardians	W. T. Jones, Master, Workhouse, Crumpsall, Prestwich.
" 23	Leigh—Fencing	Corporation	T. Hunter, Borough Surveyor, Bank Chambers, Leigh, Lancs.
" 25	Epsom—Iron Pipes, &c.	Urban District Council	W. Young, Manager, Waterworks, East Street, Epsom.
Oct. 9	Mussoorie, India—Pipes, &c.	Municipal Board	C. H. Shanahan, Municipal Office, Mussoorie.
" 10	Southall—Fencing, &c.	Urban District Council	R. Brown, Engineer, Public Offices, Southall.
No date	Rochford—Water-mains	Rural District Council	H. T. Sidwell, Engineer, Rochford, Essex.
ROADS AND CARTAGE:			
Sept. 21	Rugby—Highway Repairs, &c.	Rural District Council	T. W. Willard, Surveyor, Rugby.
" 22	Brighton—Granite	Town Council	Borough Surveyor, Town Hall, Brighton.
" 22	Nelson—Private Street Works	Streets Committee	B. Ball, Borough Engineer, Nelson.

[Continued on p. xvi.]

PERFECTION

IN

Spring Hinges

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ARCHITECT and SURVEYOR'S ASSISTANT requires ENGAGEMENT, 16 years' varied experience town and country. Eight years' Government appointment. Domestic, school, and hospital work.—Apply to H. Manor House, Northstoke, near Bath. 1378

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ARCHITECT'S ASSISTANT (24) disengaged; nine years' experience; good draughtsman, designs, working drawings, details, &c.; London or country.—W. H. L., 83, Elspeth Road, Clapham Common, S.W. 1374

ARCHITECT'S JUNIOR ASSISTANT (21) desires SITUATION, free after 23rd September. Four years' experience. Advanced building construction certificate. Moderate salary.—C. E. H., 263, Broad Street, Birmingham. 1341

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See p. xx for the Employment Register.

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W. W. SETON,
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Educational—cont.

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The Day and Evening Continuation Schools will open on Monday, September 25th. Intending Pupils are requested to forward their names to the Secretary as soon as possible.

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A pamphlet containing full information as to the classes and advantages of membership may be obtained on application to the Secretary, 18, Tufton Street, Westminster, S.W.

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By Order,

A. E. MATTHEWMAN,

Town Clerk,
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DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
ROADS AND CARTAGE—cont.			
Sept. 22	Salford—Flagging	Guardians	H. Lord, F.R.I.B.A., 42 Deansgate, Manchester.
" 23	Paddington—Granite Chippings	Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.
" 23	London, W.—Making-up, &c.	Paddington Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.
" 25	Perth—Causewaying	Town Council	R. M'Killop, Surveyor, 12 Tay Street, Perth.
" 25	Wigton—Unbroken Metal	Guardians	J. F. W. Ritson, Clerk, 4 West Street, Wigton.
" 25	Bishop's Stortford—Gravel	Urban District Council	Surveyor to the Council, Bishop's Stortford.
" 25	Bishop's Stortford—Materials	Urban District Council	T. Swatheridge, Clerk, Council Offices, Bishop's Stortford
" 26	Hanwell—Broken Granite	Urban District Council	Urban District Council Offices, Hanwell, W.
" 26	West Hartlepool—Street Works	Corporation	Nelson F. Dennis, Borough Engineer, West Hartlepool.
" 26	Mitcham—Granite Spalls	Guardians	J. A. Battersby, Clerk, Holborn Union Offices, 53 Clerkenwell Road, London, E.C.
" 28	Romford—Materials	Urban District Council	Surveyor, Council Offices, Romford.
" 29	Hitchin—Granite	Urban District Council	W. Onslow Simes, Clerk, Town Hall, Hitchin.
" 30	Swanage—Making-up	Urban District Council	T. Randell, Clerk, Town Hall, Swanage.
Oct. 2	London, S.E.—Kerbing, &c.	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford.
" 4	Wanstead—Making-up	Urban District Council	Council Offices, Wanstead, N.E.
" 4	Watford—Granite	Urban District Council	H. Morten Turner, Clerk, 14 High Street, Watford.
SANITARY:			
Sept. 21	Camberley—Sewerage and Sewage-disposal Works... ..	Urban District Council	Willcox & Raikes, 63 Temple Row, Birmingham.
" 21	Blackburn—Collection of Refuse	Scavenging Committee	W. Stubbs, Borough Engineer, Blackburn.
" 23	Dorking—Sewerage Works	Urban District Council	G. R. Strachan, 9 Victoria Street, Westminster, S.W.
" 23	Northmolton—Sewers	Rural District Council	F. Day, Clerk, 9 East Street, Southmolton.
" 25	Southwick—House-refuse Removal	Urban District Council	G. W. Warr, Surveyor, Council Offices, Southwick, Sussex.
Oct. 30	Walmer—Removal of Refuse	Urban District Council	Surveyor, Council Offices, Walmer.
" 4	Watford—Sewerage Works	Urban District Council	Council Offices, High Street, Watford.
" 4	Watford—Sewer Pipes	Urban District Council	Council Offices, High Street, Watford.
TIMBER:			
Sept.] 25	London, E.C.—Telegraph Poles... ..	General Post Office	S. C. Hooley, Stores Dept., G.P.O., 17 & 19 Bedford St., London, W.C.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Sept. 23	Cheshunt—Library	—	£1 IS.	A. Collingwood Lee, Manor House, Cheshunt.
Oct. 9	London—Shop Fronts	£75	—	W. H. Smith & Sons, 186 Strand, W.C.
" 16	Preston—School	£50, £30 and £20	—	Director of Education, Education Offices, Preston.
Nov. 4	Maesteg—Chapel	—	—	W. Job, Llynir Lodge, Maesteg, Wales.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).



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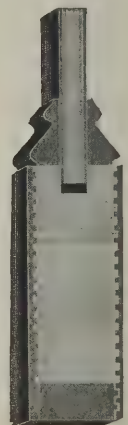
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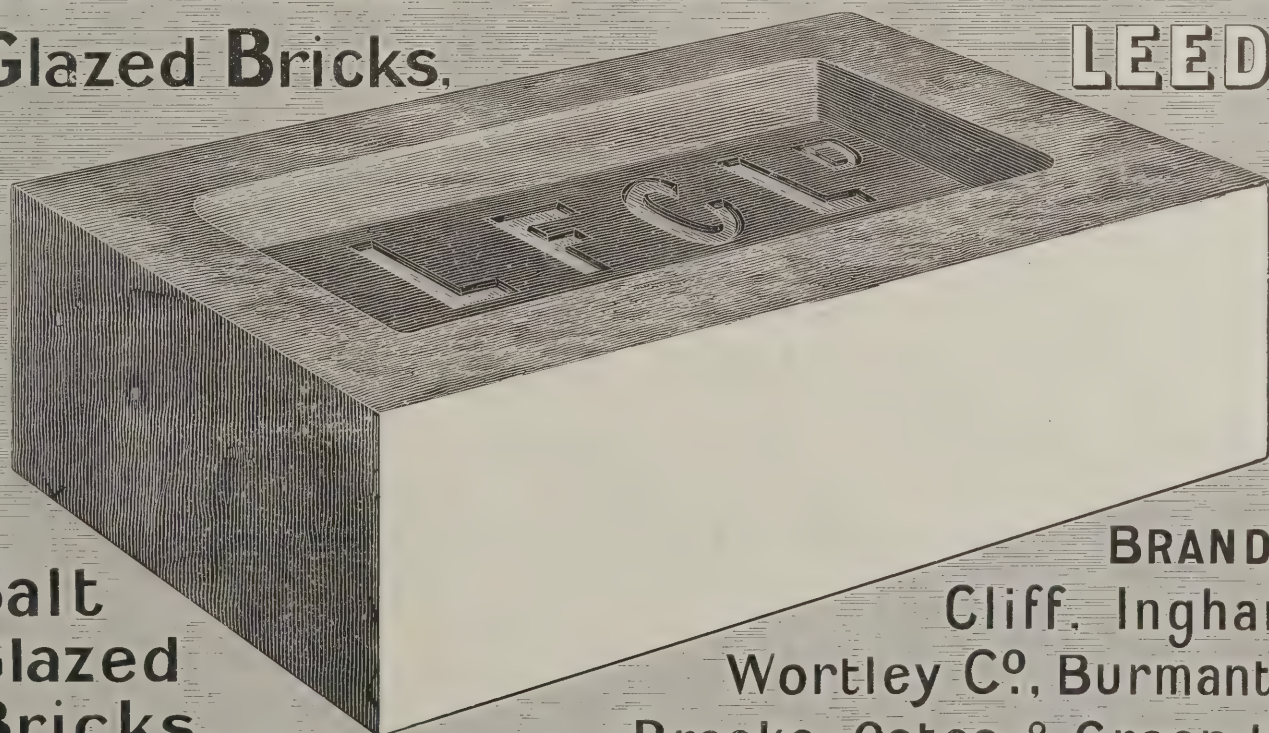
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Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonated ...	per ton	16	0	0	—	—	—
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	0	16	3	—	—	—
Petroleum, American ...	per gal.	0	0	5½	0	0	5½
Do. Russian	do.	0	0	5½	0	0	5½
Pitch	per barrel	0	8	0	—	—	—
Shellac, orange	per cwt.	9	0	0	—	—	—
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	5	6	1	5	9
Tar, Stockholm	per barrel	1	5	0	—	—	—
Turpentine	per cwt.	2	6	9	—	—	—

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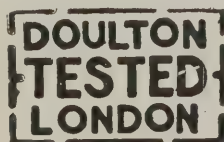
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Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	14	7	6	—	—	—
Do. pipe	do.	15	0	0	—	—	—
Nails, cut clasp, 3in. to 6in. ...	do.	16	0	0	—	—	—
Do. floor brads	do.	9	5	0	—	—	—
Steel, Staffs, Girders and Angles	do.	5	7	6	5	12	6
Do. do. Mild bars	do.	6	0	0	6	5	0
Tin, Foreign	do.	146	2	6	146	12	6
Do. English ingots	do.	147	10	0	148	10	0
Zinc, sheets, Silesian ...	do.	29	0	0	—	—	—
Do. do. Vieille Montaigne ...	do.	29	10	0	—	—	—
Do. Spelter	do.	26	0	0	26	12	6

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Soft Woods.

Fir, Dantzic and Memel ...	per load	2	12	6	5	0	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American ...	do.	3	3	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Sandarne, Yellow, 3rd, 4x9 ...	per std.	12	5	0	—	—	—
Do. Skutskar, Yellow, 4th, 3x11 ...	do.	8	5	0	—	—	—
Do. do. do. 5th, 3x11 ...	do.	7	5	0	—	—	—
Do. Nederkalix, Yellow, 1st, 3x9 ...	do.	8	15	0	—	—	—
Do. do. do. 2nd, 3x11 ...	do.	8	5	0	—	—	—
Do. do. do. 3rd, 3x6 ...	do.	7	5	0	—	—	—
Do. Kovda, Yellow, 3rd, 3x9 ...	do.	9	10	0	—	—	—
Do. Keret, Yellow, 4th, 3x9 ...	do.	7	15	0	—	—	—
Do. Riga, Yellow, Unsorted, 2½x7 ...	do.	8	0	0	—	—	—
Do. do. White, Unsorted, 2½x7 ...	do.	7	15	0	—	—	—
Battens, all kinds ...	do.	6	15	0	13	0	0
Flooring Boards rin. prepared, 1st ...	persquare	0	9	9	0	10	9
Do. 2nd	do.	0	8	6	0	10	0
Do. 3rd, &c.	do.	0	8	9	0	9	6

Hard Woods.

Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick ...	do.	2	0	0	4	5	0
Do. Quebec do.	do.	2	5	0	4	10	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	3½	0	0	4
Do. Honduras	do.	0	0	3½	0	0	4
Do. Tobasco	do.	0	0	5	—	—	—

Whitewood, American, logs	per ft. cu.	£	s.	d.	£	s.	d.
Do. do. planks and boards	do.	0	1	3	0	1	0
Elm, Quebec	per load	4	5	0	8	10	0
Jarrahi, plank	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0	0	4½	0	0	6
Do. Tobasco	do.	0	0	3½	0	0	6
Do. Cuba	do.	0	0	3½	0	0	5
Do. African	do.	0	0	3	0	0	5
Oak, Waincott	per log.	3	0	0	7	0	0
Teak, Indian, logs ...	per load	9	15	0	19	0	0
Do. do. planks	do.	12	15	0	20	10	0

Coming Events.

September 19-23.

NATIONAL ASSOCIATION OF MASTER HOUSE-PAINTERS AND DECORATORS. — Convention at the Guildhall, Plymouth.

Wednesday, September 20.

INSTITUTE OF SANITARY ENGINEERS. — Opening Sessional Meeting, Council Chamber, Holborn Restaurant, at 7 p.m.

Monday, September 25.

ARCHITECTURAL ASSOCIATION. — Day School commences at 9.45 a.m. and Evening School at 6.30 p.m.

Saturday, September 30.

NORTHERN ARCHITECTURAL ASSOCIATION. — Students' Sketching Club Excursion.

Wednesday, October 4.

KING'S COLLEGE, LONDON. — Course of Training for Sanitary Inspectors in Building Construction commences.

Friday, October 6.

ARCHITECTURAL ASSOCIATION. — Annual General Meeting, President's Address and Distribution of Prizes, 7.30 p.m.

Saturday, October 7.

ROYAL SANITARY INSTITUTE. — Provincial Sessional Meeting at the Guildhall, York, at 11 a.m. Discussion on "Pure Milk Supply."

Friday, October 13.

ROYAL INSTITUTE OF BRITISH ARCHITECTS. — Annual Dinner in Newcastle.

Tuesday, October 31.

UNIVERSITY COLLEGE, LONDON. — Professor E. A. Gardner on "Architectural Sculptures."

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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

September 27, 1905. Vol. 22, No. 555.

6, Great New Street, Fetter Lane, E.C.

Summary.

Speaking on decoration last Wednesday at the painters' and decorators' conference at Plymouth, Mr. Haité said that while recognizing their achievements as painters he felt that possible decorative conceptions by men such as Burne-Jones, Rossetti and William Morris were lost for the lack of a technical training which should have been elementary to them. (Page 174.)

The architecture of the Liège Exhibition is of no great importance, though included in it is a splendid new bridge. The most striking part of the temporary work is, perhaps, the monumental entrance, which is of the light grandiloquent character customary in exhibition design. The main buildings are very irregularly laid out, and add nothing to the subject of exhibition planning. (Page 176.)

Shearing stresses in masonry are no less important than compression stresses, and need to be taken into account when designing masonry structures. (Page 187.)

The late Mr. Waterhouse died worth £163,575. (Page 182.)

The Victoria Embankment up to date has cost something like two millions. Tar macadam is now being put down experimentally, as the roadway, though often repaired, has hitherto been very unsatisfactory. (Page 180.)

Mr. Thornycroft's memorial to Mr. Gladstone, westwards of St. Clement Danes Church, in the Strand, is to be unveiled on October 21st. (Page 181.)

Splendid new tapestries worked on the Morris looms at Merton Abbey have been arranged in conjunction with Burne-Jones's "Adoration" subject as a war memorial in Eton College Chapel. (Page 178.)

Centres for domes and arches are usually constructed in position piece by piece, previously fitted and marked, rather than built complete on the ground and slung into position with a crane, which would be liable to distort them. A very novel centering was used by Prof. Beresford Pite at Christ Church, Brixton. (Page 180.)

Paris is up in arms against a proposal that part of the Bois de Boulogne should be allotted for building purposes. (Page 181.)

At the new central baths at Bradford, just opened, the dressing-boxes, instead of being arranged around the swimming-bath as usual, are grouped in an adjoining apartment, and can be taken down so as to leave the room clear for concerts, &c., in winter time. (Page 182.)

A test recently carried out for our special information shows that hollow terra-cotta blocks can be used for constructing partitions to safely take the load from joists of any ordinary span, and are thus fully equal in stability to brick partitions. (Page 184.)

Baths and Bathrooms.

WHEN we look at the ruins of ancient palaces and villas in Italy, Greece and Spain we see what a great place the bath has taken in the planning. A special room was usually devoted to it, consisting of a shallow pool with perhaps a fountain in the centre and flower plots and vases disposed around. This compartment was very often open to the sky, but was also sometimes covered. From an inspection of Pompeian houses it has been suggested that the central court in which the bath was placed was the origin of the crossing in the early Christian churches, and that this led to the cross type of plan. Of course in Eastern climates the bath must necessarily be a very important feature; and in Persia and India to-day in all the large houses it is the subject of almost as much attention as it was in the days of Greece and Rome. In northern latitudes, however, it is not such a necessity, and has in fact been practically ignored. Only of recent years have we understood the hygienic value of bathing, and the bathroom has become a necessary adjunct to the modern house, while the provision of public baths is now a feature of municipal enterprise. It seems strange that the bathroom should not receive more careful attention at the hands of architects. The charm of a court with a shallow bath and fountain opening from the living-rooms has been overlooked in the designing of large houses. The old model might be again adopted, though naturally it would not be advisable to have it open to the sky, as permissible in a warmer climate; but there seems no reason why the bathroom and the conservatory should not occasionally be combined. Means could easily be taken to allow the bathroom to be enclosed at any time when the inmates required to perform their ablutions. We recollect one small design in an Academy exhibition where a bathroom of this type opened out of the studio in an artist's house, and this must have been most charming. The decoration of the floor and sides of such a bath in mosaic and the walls in tiles suggest boundless possibilities. In smaller houses such a bathroom would be out of the question, but even in this case the matter deserves attention. There are now such a number of fittings, each having its special advantage, that the provision of a simple sofa bath is not sufficient. There are the shower bath, sitz bath, vapour bath, and lavatory, all of which might be required in a large bathroom. Where space is restricted, as in very small houses or cottages, the folding bath now offers a solution to the difficulty, but in dwellings for the working classes the advisability of a bath is somewhat doubtful. It is very often used as a receptacle for rubbish,

and only increases the cost. In towns the public baths allow persons to bathe regularly if they so desire—which many do not—but, as regards the country cottage, we notice that only on Saturday last Miss Constance Cochrane, of the Housing and Sanitation Association, at a conference held at the Garden City, Letchworth, said that as a result of a canvass of fifty families in seven villages in Cambridgeshire, Huntingdonshire and Bedfordshire, very few expressed a desire for a bath, being satisfied with the tub.

It is only in the nature of things that scaffold accidents should frequently occur, but the inquest held at the City Coroner's Court last week on a painter who was killed while at work on a building in Upper Clapton was the occasion for some suggestive remarks by one of His Majesty's Inspectors of Factories and by Dr. Waldo, the coroner. The evidence showed that on Tuesday last week a painter was standing on a gin plank painting a window on the first floor of a building in course of construction, when he fell and broke his back. The plank on which he was standing was found to be undamaged, so that he must have overbalanced himself. Mr. Davison, His Majesty's Inspector of Factories, said that there were no compulsory regulations for safeguarding scaffolding. The Home Office had made certain regulations, but at present they were merely optional. Nothing was easier than for a man working on a scaffold to tumble, and so long as building operations were carried on in the present way he was afraid these accidents would continue. Asked if the Home Office intended to make these regulations compulsory, he said this might be done, but the present regulations would hardly touch this particular case. He also said that the district surveyor had very little power to control scaffolding. After the jury, in returning their verdict, had expressed the opinion that steps should be taken to see that precautions were observed in the case of workmen engaged on scaffolding, the coroner very sensibly remarked that the difficulty was as to where the precaution was going to end; he supposed workmen were bound to take some risks. It will be recollected that the London County Council, in the Bill for amending the London Building Act which they placed before Parliament last session, proposed to regulate scaffolding on buildings, and we do not see that builders could have any legitimate objection to being held responsible for scaffolds made in accordance with any regulations intended to safeguard the lives of workmen; but of course these regulations should be sensible ones and not too stringent.



(Royal Academy Exhibition, 1905.)

This stable is now being built. It is of local purple-grey stocks with red window dressings and quoins. The roof is to be covered with old tiles. The accommodation on the ground floor is shown by the plan. There is a loft over the main stable and a groom's room over the harness-room. Mr. George L. Alexander, of London, is the architect and Mr. James Jackson, of Bramley, the builder.

PAINTERS AND DECORATORS IN CONFERENCE.

UNDER the presidency of Mr. H. Vigurs Harris the twelfth annual convention of the National Association of Master House Painters and Decorators of England and Wales was held at Plymouth last week. The proceedings opened on Tuesday with a reception at the Guildhall, followed by the opening of the exhibition of painters' and decorators' materials by Sir Joseph Bellamy. Various reports from different committees were received.

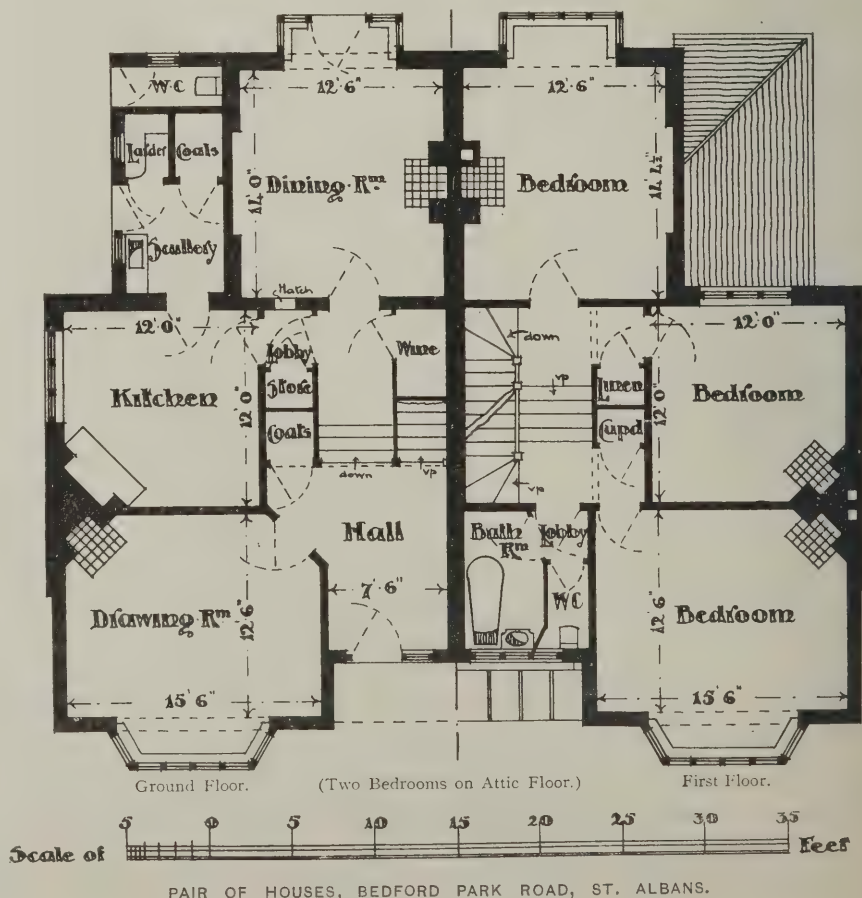
The Contract System.

In the course of his presidential address Mr. Vigurs Harris said that until about ten years ago the house-painting and house-decorating trade was rather on the down grade. On the commercial side there had been a distinct depreciation; workmen were not so qualified as they were thirty or forty years ago; the unhappy side of trade unionism was sometimes unduly predominant, and there had been a scarcity of good and steady operators. He thought, however, through the energy and service of the Association they were beginning to alter that state of things. He had tried himself to determine the reason of the decadence, but he had never been able to discover any satisfactory explanation, saving the alteration in the public method of having work done. They had changed from the old-time method of keeping the man who had served them well, and the whole of the public—public bodies especially—accepted the system of contract by public tender. He believed that the system of wild and almost unchecked competition had had a most disastrous effect on a great many branches of the building trade, and not least upon the trade of the painter and decorator. The reason was that when things were reduced to their lowest level, and a man did not know whether he would get out with 5, 10 or 20 per cent. profit or loss, he did all he could to save himself from loss. What was the result? Apprentices were no longer so carefully trained, because they were turned into money-producers. But he thought the day might come when the public would have some method which was rather more scientific than that which obtained at the present day.

On Wednesday Mr. G. C. Haité, R.I., read a paper on

The Future of Decoration in this Country. He said the fine arts were not the cause but the effects of the commercial energy and prosperity of a nation, while the applied and industrial arts were just the opposite. He would be a courageous man to prophesy on the future of decorative art in Great Britain, but as one who had seen the changes of the past thirty years he might be permitted to speculate on the subject.

Decorative and applied art was governed absolutely by rules and laws which, if observed, would dignify even the ordinary achievement by its intelligence and fitness, but if avoided would nullify the greatest efforts of genius and render them examples of misapplied efforts. These principles of law were impartible, and should be imparted. Art could not be taught, but inherent abilities could be directed. The knowledge of the governing laws of art could be imparted, and must tend to the appreciation of art.



The Royal Academy schools had provided professors of painting, sculpture, architecture, anatomy and chemistry. Had not the time arrived for a professor of decoration — of applied design? Truly the why and wherefore of much of the past mischief was to be laid on the Royal Academy, which had dominated the fashion and educated the public to regard decoration as something quite inferior to painting. The painters had received honour denied to the other branches, so that able men had been content, if not compelled, to be known by a third-rate picture rather than as masters in any other phase of art.

What good has Pictorial Art done?

One was bound to ask: What had pictorial art, even of the most exalted kind, done for the nation? In comparison with architecture and the applied arts, had it assisted in the making or moulding of its greatness? Would it have retarded our advance, or would our position to-day be other than it was had pictorial art never flourished? The advancements and achievements in the name of art which had added to the nation's reputation and wealth had been in the direction of design, architecture and sculpture, and that too in most cases by men who worked and died, neglected in life, forgotten in death, and unknown to the majority of self-dubbed, so-called artists.

But decorative art and the claims of decorative artists were coming to the fore, and if from indifference decorators failed to take advantage of this, it would be their own fault. The fearless expression of honest opinion was needed. The dogma of a painter, even if that of a Royal Academician, was not to be accepted because he presumed on such distinction. They should not accept these self-elected teachers when they used their names to deal with matters of which they were practically unfamiliar, even when they came with an alphabet of letters behind their names or surrounded with all the glamour of knighthood, inevitably associated though that honour must always be with the makers of jam and purveyors of bacon. There was an increasing number of painters who were ambitious of being accepted as

Decorative Artists,

and if they would sink their pride and submit to be taught the principles of decorative art by those competent to teach they might get within a reasonable distance of their ideals and ambition. The stained-glass windows of Sir Joshua Reynolds and the lions of Sir Edwin Landseer, one would have thought, were warnings enough; and while recognizing their achievements as painters, he felt that possible decorative conceptions by men such as Burne-Jones, Rossetti and William Morris were lost for the lack of a technical training which should have been elementary to them.

Incompetent Teachers.

The national schools of design had produced few artists, and still fewer those trained in the understanding of art. It was not too much to say that the majority of art teachers and directors were in such positions not by inclination or endowment, but were driven there by want of opportunity from exercising their abilities in the direction they might have been more or less trained in, and in many cases there were men instructing students to work on lines and in a profession in which they themselves had found nothing but failure and disappointment. The progress of art generally had been retarded by association with political faith; on the other hand, he would welcome a stronger religious faith than had been shown in the last decade, if only for art's sake.

In these days of multitudinous schools of art it was common to find a host of amateur decorators, bookbinders, metal-workers, &c., all possessed with a carefully trained "mis"-understanding.



PAIR OF HOUSES, BEDFORD PARK ROAD, ST. ALBANS. HAROLD GOSLETT, A.R.I.B.A., ARCHITECT. (Royal Academy Exhibition, 1905.)

These houses are built with local red facing bricks, cement rough-cast, and Bedfordshire tiles. In consequence of the site being 6 ft. below the level of the road, it was found necessary for the sake of economy to arrange the front and back rooms on different levels. In order to obviate the many objections of having the kitchen, bathroom and w.c. opening direct on to the hall or landing—a common fault in houses of this size and class—they have been cut off by lobbies, the kitchen lobby at the same time forming a servery to the dining-room. The total cost of the pair of houses, inclusive of the architect's commission, was 7d. per ft. cube. The builders were Messrs. Vail & Williamson, of St. Albans.

In conclusion he expressed the belief that there was a good time coming, when shoddy material and indifferent work would not be tolerated. What was likely and desirable was the broader and more liberal mind of the better educated in such matters and the knowledge which would see through the mask of humbug and sham. He ventured to predict that the future of decoration and decorative art would be more in the hands of those properly trained and would be regarded as worthy to rank with the other arts, that there would be additional professorships at the Royal Academy of Arts, and that the trade would work under conditions that would cause good work to be recognized, appreciated and equitably remunerated.

The Manchester School.

Mr. A. E. Bramley headmaster of the Association's painting school at Manchester, read a paper on "Methods of Training for Decorators." He gave an interesting description of the daily routine, methods and ideals

of their school. The Saturday morning work, he explained, was of a general and interesting type. Then all the sketches and note-books were examined and marked, whilst the students' studies and designs for the week were placed on the walls and criticized by the master, so that the defects as well as the merits of each student became a lesson and instruction to all. Another feature of the morning was the training of the powers of memory and observation by drawing without copy some well-known object or work which had been previously executed in the school or sketched from a design which had been exhibited for, perhaps, a minute or so and then withdrawn.

The fifth annual meeting was also held on Wednesday afternoon, when Mr. J. H. Turner, of Wakefield, was elected president for the ensuing year; Messrs. Contrall (Manchester), Teal (Birmingham), Smyth (West Hartlepool) and Evans (Bristol) being appointed vice-presidents, and Mr. J. W. Bellamy (Birmingham) elected treasurer.



LIEGE EXHIBITION: MAIN FACADE WITH MONUMENTAL ENTRANCE TO THE INDUSTRIAL AND MACHINERY HALLS.
HASSE AND SOUBRE, ARCHITECTS.

THE LIEGE EXHIBITION.

THE international exhibition which is being held this year at Liège cannot be ranked with similar exhibitions of its kind held in previous years, although undoubtedly of considerable importance to Belgium and France. It was promoted at an auspicious time, for this year is the seventy-fifth anniversary of the declaration of Belgian independence, and celebration fêtes have been held on a most lavish scale in all the large towns.

Liège offers an admirable centre for such an exhibition. It contains over 175,000 inhabitants and is surrounded by numerous large works which give employment to many thousands of people who might be expected to visit the exhibition.

The architecture of the exhibition is not of great importance; in fact, it is distinctly inferior to that of smaller exhibitions, such as Wolverhampton or Dusseldorf. The Glasgow exhibition was of much greater merit and far superior to this in architectural treatment.

The total area covered by the exhibition is more than 170 acres. It consists of four

sections, the three most important being near the junction of the Ourthe and Meuse, while the fourth is in the Parc de Cointe. It is to be noted that the course of the Ourthe has been diverted from its original bed into a new canal called the Canal de Derivation, whilst the old bed of the river, which formerly made a sweep round what are now the exhibition grounds, was filled up and thrown into the area of the exhibition. This necessitated the construction of several bridges, and various other improvements have been made to the city, all of a permanent character and adding considerably to its beauty and the possibility of extension in the suburbs. One of these new bridges, the Pont de Fragnée, is a very fine work, as will be seen by the photograph reproduced on this page. The River Meuse is here about 600ft. wide and the bridge (of the three-hinged arch type) is remarkably light in construction, recalling the Alexander III. bridge at Paris, but not overlaid, as that bridge is, with lamp standards. It shows the ability of foreign architects and engineers in designing fine construction. The columns at the ends of the bridge are decorated with

sculpture by a Belgian artist, Victor Rousseau. M. Demany was the architect. The constructional work was executed by the Société Anonyme John Cockerill, the well-known engineering firm of Seraing.

The main portion of the exhibition is situated partially in the parks of the Acclimatation and Boverie. The former is the old "Zoo" of Liège, while the latter, where the palace of fine arts is situated, used in former years to be specially favoured by cyclists and members of the rowing club.

There are several entrances into the exhibition. Visitors arriving at the Guillemins station would probably first enter the Fragnée, which is devoted to side-shows, and would then cross the new bridge and enter the portion called Old Liège, which consists of reproductions in plaster of old buildings in the city, somewhat on the lines of Old London at Earl's Court.

Again crossing a bridge, the Pont de Fétinne, we arrive at the Vennes—the industrial quarter—where the Palais des Fêtes and the industrial and machinery halls are situated. Returning again, but taking another bridge, the Pont Hennebique



THE NEW PONT FRAGNEE OVER THE MEUSE AT LIEGE, CONNECTING PORTIONS OF THE EXHIBITION. DEMANY ARCHITECT.

constructed of reinforced concrete on the Hennebique system) we reach the Parc Boverie, which is an island and contains the Palace of Fine Arts, the Canadian pavilion, the Palace of Ancient Art, the Palace of Women, and pavilions of the Congo, Tunis, Montenegro, Servia, &c. At one end of this island is the main entrance to the exhibition, near the centre of the city. In the portion removed some distance from the main portion, namely, the Parc de Cointe, are the Palace of Horticulture, the sports ground and the botanical gardens. The English section is a small one; and although it inadequately represents this country, the exhibition is not of sufficient importance to warrant much display.

The main industrial and machinery halls, illustrated on the opposite page, were designed by MM. Hasse & Soubre, the architects of the exhibition. The main front is the only one of importance, the rest of the buildings being constructed of galvanized iron on a light framing and having no pretensions to architectural effect. The planning is also very irregular, and adds nothing to the subject of the design of exhibition buildings. The façade, it will be seen, has a main entrance of the light grandiloquent character that is customary in exhibition design, being flanked on either side by towers. The main entrance is domed and decorated with paintings that give a rather pleasant impression with their remarkable wealth of colour. At the foot of the horse-



PAVILION OF MONTENEGRO. CARBONARE, ARCHITECT.

shoe arch are large groups of statuary. The central avenue leading from this entrance contains exhibits of bronze, decorative art, jewellery, furnishing and glass, on the left-hand being the French, Dutch, Russian, Turkish, Austrian, Swiss and the social, economy, hygienic and educational Belgian sections; while on the right-hand side of the avenue are the German, English, Chinese, American, Italian and Japanese sections, and the civil engineering, scientific, commercial and chemical Belgian sections; and finally behind these the machinery hall—the largest and most important part of the exhibition.

Among the exhibits there is very little of note as regards the building trade. The social economy and hygienic sections contain a number of plans of small houses for workmen, showing that Belgium also has its housing problem, but the plans offer no suggestions to English architects, and in the majority of cases they are far inferior in design and economy. One notable point about the exhibits in these sections is that architects in Belgium are not above advertising themselves. Several men of eminence have taken special stands upon which they display perspectives, photographs and plans of buildings which they have executed.

Reinforced concrete is now considered of great importance in Belgium for the construction of buildings, and all the well known foreign firms are represented at the exhibition.

Adjoining the main building is the Palais des Fêtes (illustrated on the next page) in which all the important meetings, international congresses, lectures, fêtes, concerts, &c., have been held.

Coming to the Boverie portion of the exhibition, the city of Liège is represented by a permanent structure in the old half timber, stone and brick style typical of Belgium. In this pavilion the three municipal departments—the public works, education and the état civil—have representative collections of exhibits, the first being especially interesting, as it deals with sewage and waterworks and architecture. Near this is the pavilion of Servia, in the form of a Servian monastery, with white walls and a red-tiled roof, designed by M. Dainef, of Liège. Next to it is the pavilion of Montenegro, also in Servian style,



MONUMENTAL ENTRANCE LIÈGE, EXHIBITION.

designed by M. Carbonare, of Venice. We illustrate this pretty little building.

Adjoining is the Palais des Femmes, in which are shown examples of women's work; a number of lace workers and others are actively engaged therein. This building is in the simple French Renaissance style. Opposite is the Palace of Ancient Art, which is without distinction, although the centre of the façade represents the old town hall of Liège, which was destroyed in the seventeenth century, while other parts represent the fronts of various old houses of the city. This conglomeration makes the building absurd.

Next to this is the Canadian pavilion, the size of which is another indication of the enterprise of this go-ahead British colony. Adjoining is the Palace of Fine Arts, a permanent building constructed of stone and containing works by contemporary artists. It is divided into four sections, the first dealing with paintings, the second with sculpture, the third with prints and lithographs, and the fourth with architecture. The area of the building is about 2,500 square metres; it is intended to be used after the exhibition as a municipal art gallery and for concerts, receptions, congresses, &c.

The Tunisian, Algerian, Bulgarian, African, Asiatic and Congo pavilions are small structures of the usual fanciful exhibition type.

Taken as a whole, therefore, the exhibition can hardly be ranked an international one, though thoroughly representative of Belgian enterprise.

BURNE-JONES AND MORRIS TAPESTRIES AT ETON.

THE Eton College war memorial has now been completed, so far as the chapel is concerned, by the erection of three large figure tapestries, which envelop the new communion table of black marble, and cover the east end wall up to the painted cornice. The centre-piece is the well-known "Adoration" subject by Burne-Jones, which was made for the chapel some years ago and has hitherto hung facing the doorway, on the south wall. This has now been flanked on either side by new tapestries worked on the Morris looms at Merton Abbey, and containing pairs of angels reproduced from the Burne-Jones windows at Salisbury Cathedral. The art of weaving these tapestries was re-discovered by William Morris partly through an old book and partly by manual experiment. It is the ancient Gobelins method, long since lost or abandoned by the Gobelins and now practised nowhere but at Merton. The work is entirely done by hand, and is largely at the discretion of the workers, who must themselves be trained artists. It is for this reason probably that Eton authorities have permitted the names of the craftsmen to be worked in a narrow border along the top of one wing. The wings have taken eighteen months to weave and cost over £1,100. The "Adoration" tapestry, which was placed in the chapel ten years ago, took a year, and cost £525.

The new Sea Wall at Galveston, where, it will be remembered, a great tidal wave swept over the city some time ago, has been completed, and side by side the whole city has been lifted to the height of its protective barrier. The wall is of concrete 17ft. high and running along the Gulf for $4\frac{1}{2}$ miles. It is 16ft. thick at the base and 5ft. across the top. The wall is built on a foundation of piling, the piles going down 45ft., and it is protected from undermining by the Gulf waters by an apron of stiff shingle, as well as by a row of piles driven in front of the wall. In raising the city 2,500 houses have been lifted.



PERMANENT PALACE OF FINE ARTS, LIEGE EXHIBITION. HASSE AND SOUBRE, ARCHITECTS.



PALAIS DES FETES, LIEGE EXHIBITION. HASSE AND SOUBRE, ARCHITECTS.



THE CANADIAN PAVILION AT THE LIEGE EXHIBITION.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Charge for Writing a Specification.

LIVERPOOL writes: "What do you consider a fair charge for writing a specification for alterations to a building costing about £1,000?"

About five guineas.

Work Abroad.

ARBROATH.—R. P. S. writes: "Would it be advisable for a carpenter to emigrate to New Zealand, and if so which would be the best part to go to?"

We believe New Zealand offers plenty of opportunities to carpenters and joiners. You can obtain full information from the Emigrants' Information Office, Broadway, Westminster.

Damage to Building by Excavation for Sewer.

BLAINA.—JAGO writes: "A has built a house up to the roof. B came on next to the pine end and began to excavate for a 6in. sewer 14ins. from A's pine end, and has excavated 7ft. under A's foundation. Now the pine end has cracked through, and is leaving front and back walls. B never rammed the ground, having simply filled in with loose rubbish. What is my remedy? Can I make B repair the pine end?"

We think you are entitled to claim damages. Put the matter in the hands of a solicitor.

Plans for Heating a Church.

THIRSK writes: "In July, 1904, I submitted a plan showing a scheme for heating a church. I sent the plan to the rector, at the request of one of the churchwardens. The business has since been placed in the hands of an architect, who has had the church heated from plans submitted by him, and although I never asked for my plans to be returned when I submitted them, I have since asked the rector to let me have them back. Am I entitled to them, and if not returned can I charge for them?"

Yes, you are clearly entitled to have the plans returned or paid for.

Soundproofing and Stiffening a Floor.

WIMBLEDON.—R. C. W. writes: "The occupants of a bedroom complain of the great noise and shaking on the floor above. What is the best means of curing this? The floor is a wooden one consisting of 11in. by 2in. joists, span about 19ft. The room overhead is used largely as a passage. The bedroom must be disturbed as little as possible. Is there any other method besides pugging? And which is the readiest way to stiffen the floor? There are already two rows of herring-bone strutting."

We think the floor might be stiffened by the following means:—Place a flat iron bar 2ins. wide by 1in. thick longitudinally in the centre of the span under the middle of all the joists, and anchor it into the end walls. Then pass rods $\frac{1}{2}$ in. diameter, with screw joints, over the tops of every other joist near the ends, and secure with staples. Incline the rods down close by the sides of the joists until they pass under the bar, and tighten with the screw joints. The floor would thus be trussed up. The soundproofing should be done by slag-wool pugging.

Preservative for Decayed Stonework.

CHESTER.—M. writes: "The stonework of a building built of Talacre stone is badly weathered and laminated, and some parts are being forced off by decay. It has been suggested that the worst parts should be re-faced and the whole treated with 'Fluate' stone preservative. Is this a suitable preparation for this particular stone; how should it be applied; from whom is it obtainable; what is its cost; and can you name any building upon which it has been used?"

"Fluate" is suitable for preserving lime-stones, but as Talacre stone is a sandstone we would advise the use of either Szerelmey stone liquid, supplied by N. C. Szerelmey & Co., of Rotherhithe New Road, London, S.E.; Silicate Zopessa solution, supplied by the Granite Paint Co., Ltd., of Creek Road, Deptford, S.E.; or Browning's colourless preservative solution, supplied by the Industrial Paint Co., Ltd., 31, Cannon Street, London, E.C. "Fluate" is made by the Bath Stone Firms, Ltd., Bath, from whom all particulars can be obtained.

Attics.

LONG EATON.—DERBYSHIRE writes: "Some cottages are proposed to be built, but the urban district council refuse to pass the plans because the first-floor rooms are not 9ft. high over the whole area. I send a copy of the by-laws passed by the L.G.B. in March, 1902, referring to the heights of rooms. Do you think the council have power to compel me to build them 9ft. high. I contend they are well within the limits of the by-laws. They say that the first floor must be 9ft. high and that the 'room partly in the roof' portion of the by-law only refers to attics. What is my position, and what do you recommend me to do?"

This is only another instance of the ignorance and want of logic displayed by local officials. The bedrooms are clearly attics, and we think you have nothing to fear in building according to your plans.

Bloom on Varnish.

LONDON.—J. W. writes: "I have been executing some decorations, &c., at some chambers, amongst other items washing and varnishing work which had been previously varnished. Why is it that on some doors a blue tint or bloom should appear after about one month, while other doors and windows in the same room and under the same conditions remain free?"

Bloom on varnishes is generally due to condensation of moisture upon the surface before the varnish is hard. It can usually be removed by warmth, washing and rubbing briskly with warm water, or rubbing with a wad of wool and olive oil.

The Surveyors' Institution.

BIRMINGHAM.—X. writes: "Having passed the R.I.B.A. preliminary, I desire to pass some examinations so as to become a member of an institute of surveyors."

Write to the secretary of the Surveyors' Institution, Great George Street, Westminster.

Heating a Small Chapel.

WOLVERHAMPTON.—T. W. F. writes: "What size should a cast-iron saddle boiler be to efficiently heat a low-pressure hot-water system in a small chapel, with about 400ft. of 4in. pipe. The present boiler is 15ft. long and 2ft. wide, but the place has never been effectually heated, although I have calculated the heating surface of pipe to be more than sufficient for the cube capacity of the building. If other causes of the inefficiency of the system present themselves to you, or other forms of boiler, perhaps you will kindly make a few suggestions. The present system has been in about eleven years, and is used during the winter months only."

In selecting a boiler one should note the proportion of the weight of fuel its furnace

can contain and burn well to the total weight of water in pipes and radiators, and the proportion of heat-receiving surface in furnace and flues to heat-delivering surface on pipes and radiators. In the case given the height of the boiler is not stated, but it may be 20ins. and the water space 3ins. The boiler will then contain about 110 lbs. of water and 13 sq. ft. of surface (half of it being in the furnace), and the pipes about 2,200 lbs. of water and 420 sq. ft. of surface—proportions of about 1 to 11 and 1 to 33; and the gross furnace capacity is about 4 cub. ft., of which perhaps 2ft. will be filled with coke, weighing perhaps 80 lbs., when the ratio of fuel to water is 1 to 30. The fire-grate surface is $2\frac{1}{2}$ sq. ft., and its ratio to the pipe surface is 1 to 170, and to the weight of water 1 to 320. The ratio of grate surface and weight of fuel to weight of water are too small, and should be 1 to 600 and 1 to 20 respectively. The "saddle" form of boiler is good, but the conical upright cylinder or square is perhaps better. Take a cubic foot

of fuel, thus: 1 $\frac{5}{3}$. In the upright

boiler four sides (4 sq. ft.) are in actual contact with the boiler iron, and one shiving upwards. In a "saddle" boiler a large proportion of the ends, 2 and 4, is lost; and the flue surface is not as effective as the furnace is; but in a well-designed "saddle" it may make up for the loss. When designing or selecting a boiler it is easy to get confused among the proportions of the various parts, but that of the maximum weight of fuel the furnace can burn well to the total weight of water is always reliable; and that of the grate surface is almost as good. Before buying another boiler try whether the circulation is at fault; if the joints are made with gasket, feel along the pipes till a quick change of temperature is found, and then open that joint to pull out gasket that may be choking the pipe. See that the pipes rise or fall 1in. in 12ft. or 15ft.; a small wrought-iron pipe at the peak of the flow pipe to let out air may be all that is needed to quicken the current. If there are two or more flows, and these are not evenly heated, put a check valve in the hot one. It may be that the whole apparatus is sluggish, and full heat can only be obtained by lighting up on Friday instead of Saturday. In this case a larger boiler would be an aid. If these fail, the fault may be in (a) the brick flues, (b) the chimney, (c) the furnace, (d) the fireman. For (a) see that the smoke travels over all the shell of the boiler and has no short cut to the chimney. For (b) the chimney draught may be poor from being too high or too low, or being too small, but 9ins. by 9ins. is ample. A wider mouth chimney-pot may cure the case. If sweeping doors in outside walls are used, see that they are closed tightly, and if in doubt put in a plug to the inner space, or an inside door or shield at the flue edge of the opening to the door. For (c) get enough air through the bars, and clear out the ashpit to let air under the bars to the full extent. If new bars are needed, get a new pattern with bars $\frac{9}{16}$ in. wide, 3ins. deep and $\frac{7}{16}$ in. air spaces, cast in pairs; 8 or 10 holes, $\frac{1}{4}$ in. or $\frac{3}{8}$ in. diameter, drilled near the bottom of the furnace door for air over the fuel may be very useful if the fuel is thick on the bars. See that the damper does not slip back after being set, and open it wide when starting the fire. For (d) see that he is not charging the furnace too full; the flames must have ample room to leap and wave. Clean out clinker every day. If the ashpit be shallow draw out the ashes every time after firing; and a tray $1\frac{1}{2}$ ins. deep, filled with water, will be of great use to quench the dross and to supply vapour to keep the bars cool and free from clinker, and maintain the heat of the fuel.

O. WHEELER.

LARGE CENTRES.

THE design of large centres for arches and domes is of some importance in construction, and we illustrate an original design for a large centre by Professor Beresford Pite, F.R.I.B.A., which was used for the construction of the arches at the crossing of the nave and the transept at Christ Church, Brixton. The span of this is about 41ft. The details of the framing will be gathered from the illustration.

In the case of large centres the load is often transmitted to the ground by vertical supports, but in the present case this was not done, and the advantage in giving a clear space for traffic underneath is obvious. Sometimes with this desire for a clear way underneath the supports are inclined and are then apt to shrink and become loose-riding, on the dogs, and so throw themselves out of bearing. There is, however, another very important advantage in doing without the vertical supports in the case of arches, because if the weight is not put upon the footings during erection, when the centering is struck the sudden throwing of the weight upon the piers may cause the latter to settle unequally.

Of course during the construction of the arch the stresses in a centre are continually altering in direction and amount, and for this reason the centre has to be well braced. The method of bracing adopted in this particular case is notable.

It is usual to construct centres in position piece by piece, having previously fitted and marked them, rather than to build them complete on the ground and sling them into position with a crane, which would be liable to distort them.

Projections below the springing should be allowed for in designing centres, such as caps or neck mouldings, as these may prevent the lowering of the centre. In this case the centre is not diminished sufficiently to pass over the projections, but enough play is given.

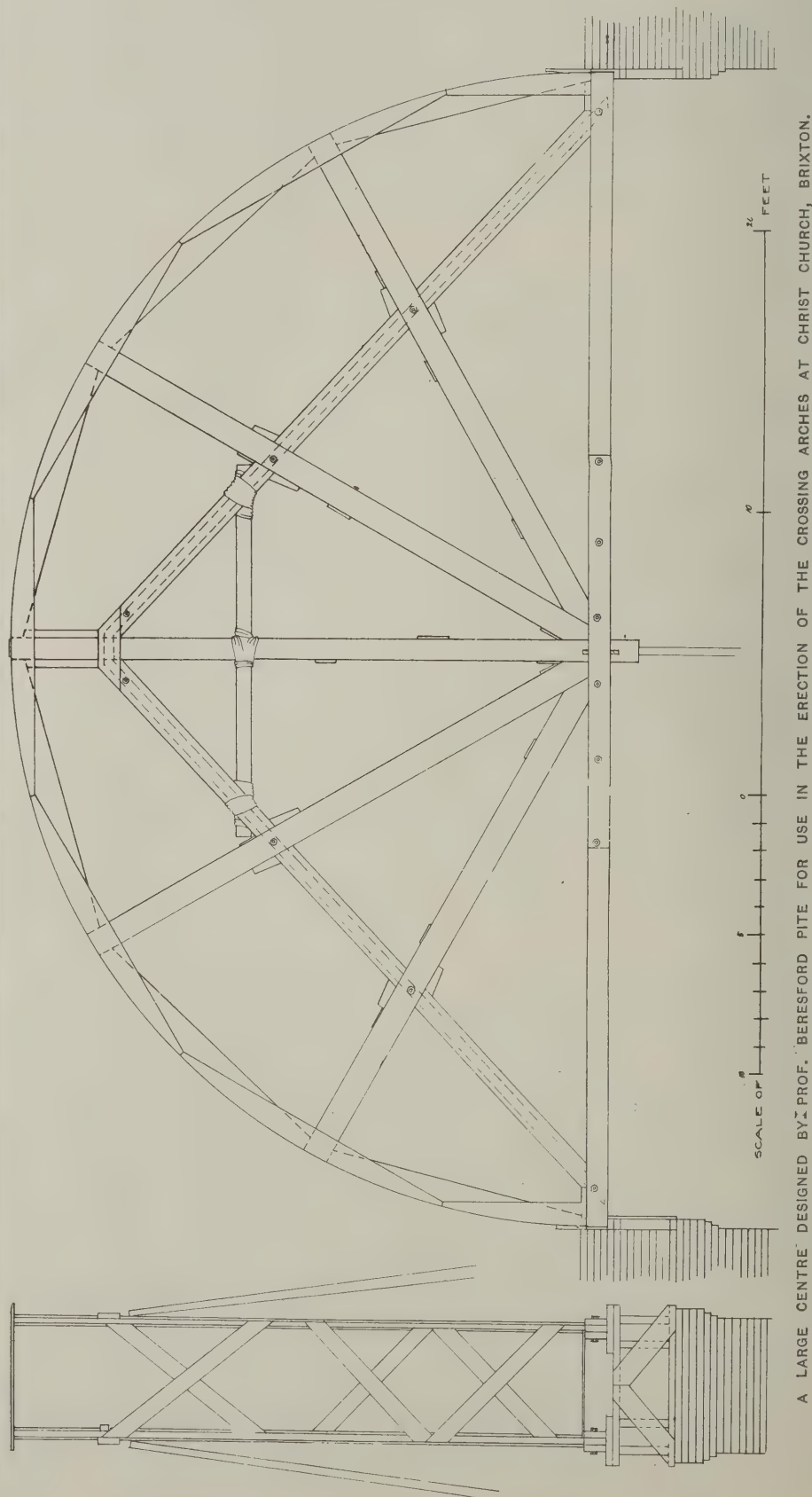
The whole weight of any arch stone is not taken by centering until it is in such a position that a vertical line drawn through the centre of gravity of the stone passes on the outside of its bed. The load gradually increases from the springing of the crown during the construction of the arch, and in a semicircular arch when about half up between the springing and crown the load will have a tendency to force in the haunches and spring the crown up. For this reason the centre needs to be made stronger in the middle than on the haunches, as a greater weight will have to be carried by that part, while the stresses from the haunches where not supported from below has to be taken from the middle of the span by framing the feet of the haunch braces into the foot of the king-post, which will counteract the tendency of the latter to rise. The stress at the crown, which comes into play later, is generally taken by braces from the head of the king-post to the ends of the tie piece, directing the stress to the supports at the springing, as shown by the accompanying illustration.

ROAD-MAKING ON THE EMBANKMENT.

THE Embankment is once again "up," but on the present occasion the London County Council is carrying out an interesting experiment with a view to avoiding the necessity of such frequent repairs. Tar macadam is being put down, and good hopes are expected of it. When the old Metropolitan Board of Works started constructing the Embankment forty years ago the nett cost of the undertaking was, at the outset, £1,156,981. Few at that time could have had any idea of what the subsequent cost would be. No sooner was the work completed than the roadway subsided, and from that year to this something like

£15,000 a year has had to be spent in order to keep the road in a serviceable condition. The reason of this, after all, is not far to seek, says the "City Press": the Embankment was constructed on ground which for years had been nothing more than the mud flats of the Thames foreshore. The result of this continual drain for repairs has brought the actual cost of the Embankment up to something like £2,000,000. Time after time it has been levelled up with many hundreds of tons of granite, and no sooner is one part finished than another section is closed to

traffic. It has been suggested in some quarters that the London County Council should take the present opportunity of thoroughly repairing the Embankment and forming solid foundations in view of the likelihood of their overbridge tramways scheme meeting with success in the near future. Possibly the experiment is not altogether unconnected with this suggestion. Engineers generally are of opinion that more time must elapse before the evil of subsidence can be thoroughly overcome. Meanwhile hopes are centred in the tar macadam.



Keystones.

The A.A. Brown Book has just been issued.

The Reports on the "Auld Brig of Ayr" have been submitted to Sir William Arrol for opinion.

A new Roman Catholic Church at Holyrood, Barnsley, has been erected at a cost of £10,000. It accommodates 700 worshippers.

Eighteenth-century Door-heads—The titles to the top right-hand and bottom left-hand blocks on p. 164 of our issue for last week should be transposed.

Mr. F. Taylor, chief architect in the Public Works Department of the Orange River Colony, has been promoted to the office of Secretary for Public Works.

The Synagogue at Bayswater has been re-decorated from designs by Mr. Lewis Solomon, F.R.I.B.A. Improvements in the heating and ventilation of the building have also been carried out.

A Scottish School.—Messrs. Kerr & Watson, architects, have prepared plans for the Johnstone School Board for a new school to seat 730 pupils. Two designs have been submitted, estimated to cost £12,000 and £10,500 respectively.

The **Fine Bridge in Ireland** is now approaching completion above Dungarvan Station. It has a total length of 1,205ft., there being seven spans, one 110ft. The opening span for navigation is built on the American Scherzer rolling lift system, and is the second of its kind in Great Britain.

New City Hall, Cape Town.—A full description of the new City Hall of Cape Town, which was officially opened on July 25th last, is given in the August number of "The South African Master-Builders' Federation Journal." Messrs. Reid & Green, A.R.I.B.A., were the architects, and Messrs. Howard & Scott the contractors.

At Downside Abbey, near Bath, a new choir and chancel have been built from designs by Mr. Thomas Garner, who is known for his work on the reredos of St. Paul's and at King's College, Cambridge. The cost has been £16,500, and the work has been executed without contractors by local masons working under Dom Philip White-side, Procurator and Bursar of the Abbey.

The **Gladstone Memorial**, on a site just westwards of St. Clement Danes Church, Strand, will be unveiled on October 21st. It is of bronze, representing Mr. Gladstone in the robes of the Chancellor of the Exchequer, and will be placed on a pedestal with a 5ft. pavement around. Accessory statues and groups, also in bronze, are included in the monument, the total height of which will be 32ft. Mr. Thornycroft is the sculptor.

Birmingham Town Hall: Alterations practically completed.—The alterations to the interior of Birmingham Town Hall have been practically completed, and the building will be reopened within the next week or two. The improvement scheme has cost about £6,000. The orchestra has been completely reconstructed, more exits have been provided, and those existing improved, and staircases have been remodelled. Mr. Fred Martin is the architect in charge.

The **fifteenth-century Oak Rood Screen of Lanreath Church, Cornwall**, has been renovated and cleaned by Messrs. Harry Hems & Sons, of Exeter. After the paint had been removed, it was found that during the last century many parts of the screen had been extensively repaired and renewed in plaster-of-Paris and other cements. This has all been cleared away and the deficient parts made good in English oak, the *motif* for the new work having in every instance been closely copied from the old.

School Additions in Battersea.—Mr. Ryan-Tenison, F.R.I.B.A., has been instructed to carry out the new wing to the Battersea Grammar School and additions at Sir Walter St. John's Schools, Battersea.

Hector Macdonald Memorial.—The foundation-stone of this memorial, at Dingwall, was laid on Monday. The architect is Mr. James S. Kay, of Glasgow, his design having been selected in competition. The cost of the memorial will exceed £1,000.

Stones without Mortar.—The pinnacles on the tower of Stoke-on-Trent Church, which are now being dismantled to give place to a new design, consist of some stones weighing more than 20 cwts. each. These have been standing merely by their own weight, the mortar having perished.

Restoration of Bolton Percy Church.—For several weeks the church of All Saints', Bolton Percy, has been in the hands of workmen, who have been renovating and carrying out alterations in the interior under the direction of Mr. Bilson, F.S.A., of Hull. The work is now rapidly approaching completion.

The **Queen's Hall at Hull**, in Alfred Gelder Street, was opened recently. It accommodates 2,000 persons and has cost £23,000, the contract for the building being £19,521. The building is designed in the late Gothic style, and the front is carried out in Ancaster and Portland stone. Messrs. Gelder & Kitchen, of Hull, were the architects. The brickwork was executed by Mr. F. Beilby, the plastering by Mr. R. Metcalfe, the masonry by Messrs. Quibell, Son & Greenwood, the joinery by Messrs. R. Finch & Co., and the plumbing by Mr. W. G. Padgett—all of Hull.

Building Plots in the Bois de Boulogne: Paris up in Arms.—Paris is up in arms against the proposal that part of the Bois de Boulogne should be allotted for building purposes. This proposal is said to involve a diminution of the park by nearly 100 acres, the felling of more than 6,000 trees, and the construction of an entirely new residential quarter at the entrance to the Bois. The Paris Municipal Council, which has purchased from the State the part of the fortification and the glacis immediately adjoining the park, cannot, it is said, afford to leave it unproductive, and consequently proposes to divide it into building lots.

Leigh Hunt's Chelsea House.—A memorial tablet has been erected by the L.C.C. on No. 10, Upper Cheyne Row. Leigh Hunt lived there from 1833 to 1840; indeed, his residences in London numbered nearly a score, but at most of them his stay was of brief duration. The Council had come to the conclusion that No. 32, Edwards Square, Kensington, where Hunt lived from 1840 to 1851, had the strongest claims to indication, but it was ascertained that this house would in all probability be demolished within the next few years, and in these circumstances the house in Upper Cheyne Row was selected. It has not been rebuilt or substantially altered since the date of Hunt's residence.

Mr. Francis T. Verity, F.R.I.B.A., the architect to the Lord Chamberlain, who has virtually been given a free hand by the directorate of the Empire in the reconstruction and re-decoration of that theatre, has been faced with the difficulty as regards the decoration, which had to be gorgeous without being gaudy. Early in October the public will be able to judge his work. The "grid" at the Empire has been raised to twice the height it was before, and the width from fly rail to fly rail is now 70ft., thus providing a stage capable of presenting the most complicated and elaborate spectacular display. The new act drop is by Mr. Joseph Harker.

Mr. Jasper J. Kelf, architect and surveyor, has discontinued his local offices at Walthamstow and Leytonstone, and is centralizing his business at Devonshire Chambers, 15 to 18, Bishopsgate Street Without, E.C.

The Austrian Exhibition.—Professor Fabiani, architect, is visiting London this month to make the final arrangements for the exhibition of Austrian products and manufactures which is to be held here next year.

A new Female Infirmary in connection with the Knaresborough Workhouse is being built at a cost of £5,000 from designs by Mr. J. Houfe, architect, of Harrogate. Provision will be made for thirty beds, day-rooms and nurses' accommodation.

A new Process for Stained-glass Windows has been introduced by Messrs. W. Meikle & Son, of Glasgow. A memorial window for the chancel of the new Monkland parish church is completed, the work being carried out without any surface pigment.

The Carnegie Trust in Dunfermline, which was set on foot by the munificence of the American millionaire, is to hold classes in architecture. Mr. Fairburn, of the Edinburgh School of Applied Art, is one of the instructors, and there is also to be a visiting lecturer.

A window from Westminster Abbey offered for Cape Town Cathedral.—The old "rose" window in the south transept of Westminster Abbey—the "Poets' Corner"—which was removed and packed up three years ago to make way for the memorial to the Duke of Westminster, has been offered to the Dean and Chapter of Cape Town for the cathedral now being built in that city. The window was put into the Abbey by the Dean and Chapter in 1840.

A Richly-carved and Traceried Screen of English oak has just been fixed in the chancel aisle of All Saints' Church, Weston, Bath. It was designed by Messrs. E. H. Harbottle & Son, of Exeter, who were also the architects for the rebuilding of the transepts and east portion of the chancel. The screen has been carried out by Messrs. Dart & Francis, Ltd., of the Ecclesiastical Art Works, Crediton, who also fixed the new chancel screen about four years ago to designs by the same architects.

The Hampton Sewerage and Sewage-disposal Works were visited last Wednesday by the Society of Engineers. Owing to the geographical configuration and contour of the neighbourhood, and to the presence of large water mains in the principal roads, the district presented exceptional difficulties with regard to the construction of sewers, and it was found necessary to employ intermediate lifts. Ultimately the Shone system of collecting and delivering the sewage was proposed and carried out.

The Extension of the Wholesale Markets at Brentford, of which the memorial stone was laid by Mr. Leopold Rothschild last week, is being carried out from designs by Mr. Nowell Parr, engineer and surveyor, and is to cost by contract £43,000. The markets will be divided into three covered ways or avenues. The central avenue is to be devoted exclusively to wagon stands—twenty-three double and thirty-six single—and the two side avenues will have corresponding spaces for the display of merchandise. Along the main walls, on the north and south sides of the markets, thirty-three shops with 15ft. frontages are to be constructed.

The London County Council's Central School of Arts and Crafts has now entered upon the tenth year of its career. During the past session 769 individual students were enrolled, mainly apprentices or journeymen in artistic trades, this number being an advance upon previous records. The school provides at nominal fees

practical instruction by specialist teachers in a wide range of handicrafts, grouped generally into (a) architecture, furniture, decoration, (b) silversmithing and kindred trades, (c) bookbinding and other crafts of book production. Pending the completion of the permanent building in Southampton Row, additional temporary premises are being equipped to meet the increasing demand. New classes are being formed in building construction, painting in tempera, &c. Prospectus and full particulars can be had on application to the Curator at the School, 316, Regent Street, W.

Partnership.—Mr. E. Jenkin Williams, F.R.I.B.A., of 17, Quay Street, Cardiff, has opened a London office at 30, John Street, Bedford Row, W.C., and taken into partnership Mr. H. Parry Morgan, who has been engaged in his office for several years. The practice will be carried on under the title of E. Jenkin Williams & H. Parry Morgan.

A new London Chimney is being built at the Blackfriars Power Station, in Upper Ground Street, by the Alphons Custodis Chimney Construction Co. When finished it will be 180ft. high, the inside diameter at the top being 8ft. 6ins. Though the biggest chimneys in the world are in London—at the Chelsea generating station—the highest is the "Hallsbrucker Hutte," in Saxony, which is 460ft.; while the tallest stack in America is 365ft. high. In London the tallest chimney is one, built of steel, which is to be seen on the way from Hammersmith to Kew Bridge. It belongs to the United Tramways Co., and is 300ft. high.

The new Post-Office.—The foundation-stone of the new post-office building on the site of Christ's Hospital will be laid by the King on Monday, October 16th. Generally speaking, it will replace the old east building at St. Martin's-le-Grand, which was designed by Smirke, completed in 1829, and is now considered by the post-office authorities to be unfit for their present work. The architect of the new office is Sir Henry Tanner, of the Office of Works. The clerk of the works will be Mr. Leak. As yet tenders for the building have not been accepted, or, if preliminaries have been arranged, contracts have not up to now been officially announced. It is understood that the new structure will preserve some of the leading characteristics of the old east building. The foundation work is in the hands of Messrs. Mowlem. It is expected that the cost of the new offices, when complete, will be about £250,000.

New Central Baths at Bradford have been erected at a cost of £7,000. Mr. A. Hessel Tiltman, F.R.I.B.A., of London, designed the building, which has been carried out, with modifications, by Mr. F. E. P. Edwards, the city architect of Bradford. The principal accommodation provided is a large swimming-bath, a series of slipper, douche and medicated baths, and Turkish and Russian baths. The usual method of surrounding the swimming-bath with dressing boxes has been abandoned, and a special apartment for dressing-rooms provided. The bath hall when turned into a hall for meetings will provide seating accommodation on the floor for 860 persons, with 680 in the galleries—in all 1,540. In the adjoining apartment the dressing-boxes are removable, and when taken down in the winter will leave a room 55ft. 6ins. by 30ft. 9ins. The building is ventilated on the plenum system, and the swimming hall is lighted with "Lucas" gas lamps, electricity being the illuminant for the special baths. The medicated baths are provided in a self-contained suite of rooms 38ft. 6ins. by 16ft., and include dowsing radiant heat and light baths, "colarium" or electric sun bath, electric massage, electric slipper bath, medicated slipper bath, vapour bath, &c.

Builders' Notes.

The Bradford Stone Trade is reported to be very depressed. Prices are said to have been never so low as they are just now, and several large quarry-owners whose yards are stocked to overflowing have been compelled to stop getting.

A Huge Quarry Blast took place recently at the Dinorwic slate quarries, Llanberis, where an enormous body of rock was impeding the development of a certain portion of the site. Ten shafts, each 32ft. deep, were bored and charged with 4 tons of Nobel's explosive gelatine, the firing being effected by a fifteen minutes' time fuse connected with detonators which fired an instantaneous fuse.

The Trade in Galvanized Sheets.—On Tuesday last week galvanized sheet-makers at their London meeting quoted a further advance of 5s., making the minimum price of 24-gauge corrugated £11 5s. per ton, which means that orders cannot be placed under £11 10s., and several works ask £11 15s., marking a rise of £2 on the low figures of last winter. Spelter is also £3 above the lowest price, which increases by about 17s. 6d. the working cost for galvanized sheets. There is no sign of the higher prices checking demand. The activity is said to be unprecedented.

Tests between Swedish and Italian Marble.—In order to ascertain the advantage of "Ringborg green" marble compared with "Blanc clair" Carrara marble when the material is used where rubbing (wear) takes place, as in the case of flooring, steps, &c., the Nya Marmorbruksaktiebolaget of Norrköping have had rubbing tests made at the Chalmer's Institute on these two kinds of marble. The result, given by the table at the foot of this page, shows that after 200 revolutions and a load of 30 kilos the average wear of the "Ringborg green" marble amounted to 53 grammes, whilst the wear of the Carrara "Blanc clair" marble at the same test was as much as 64.3 grammes. The Swedish "Ringborg green" marble has consequently shown itself to be about 20 per cent. superior for wear than the Italian "Blanc clair" marble.

A Patent Centering.—Mr. W. H. Barton, of 10, Pendarves Road, Wimbledon, has taken out a patent for providing a means whereby centering to support concrete floors during setting is dispensed with. He employs steel wire or strips wound round the joists and running between them parallel to the lower surface of the floor. Upon these wires or strips are placed sheets of thin metal or other material, with the edges overlapping. This forms the centering. When the concrete has set, the wires may be cut and drawn out, leaving the centering free for removal, or the whole may be left in position. The inventor claims that his device not only effects a considerable saving in prime cost and cartage, as compared with ordinary wood

centering, but, the necessity for struts being avoided, a clear floor-place is obtained during building operations.

Birkenhead Building Dispute: Arbitrator's Award.—The Board of Trade "Labour Gazette" states that Mr. A. A. Hudson, the arbitrator appointed to deal with certain matters in dispute between the Birkenhead and Wirral Building Trades Employers' Association and the Birkenhead and District Operative Carpenters and Joiners', Bricklayers' and Stonemasons' Societies respectively, has issued his award. The principal differences between the parties arose out of the employers' proposal that in winter the men should have breakfast before coming to work. The employers desired that the hours of work in winter should be reduced, and had proposed that the summer period should be extended and the winter period reduced, so that the aggregate hours worked through the year should not be materially reduced, but that the men should breakfast before starting. The arbitrator rejected the proposal that the men should breakfast before starting. He awarded in each case that the winter period, which formerly was from November 1st to the end of February, should be the six weeks before and the six weeks after Christmas, and that the winter working hours should be forty-two and a half a week (instead of forty-seven as formerly), the starting time being changed from 7 a.m. to 7.45 a.m. in this period. The award also dealt with other points which were of less importance.

Obituary.

Mr. John L. Black, sole partner in the firm of Messrs. Alexander Black & Son, builders, Carnoustie, died recently.

Mr. G. S. Fleetwood, of Messrs. Fleetwood & Sons & Eversden, surveyors, New Court, Carey Street, London, was found drowned at Herne Bay on Thursday last.

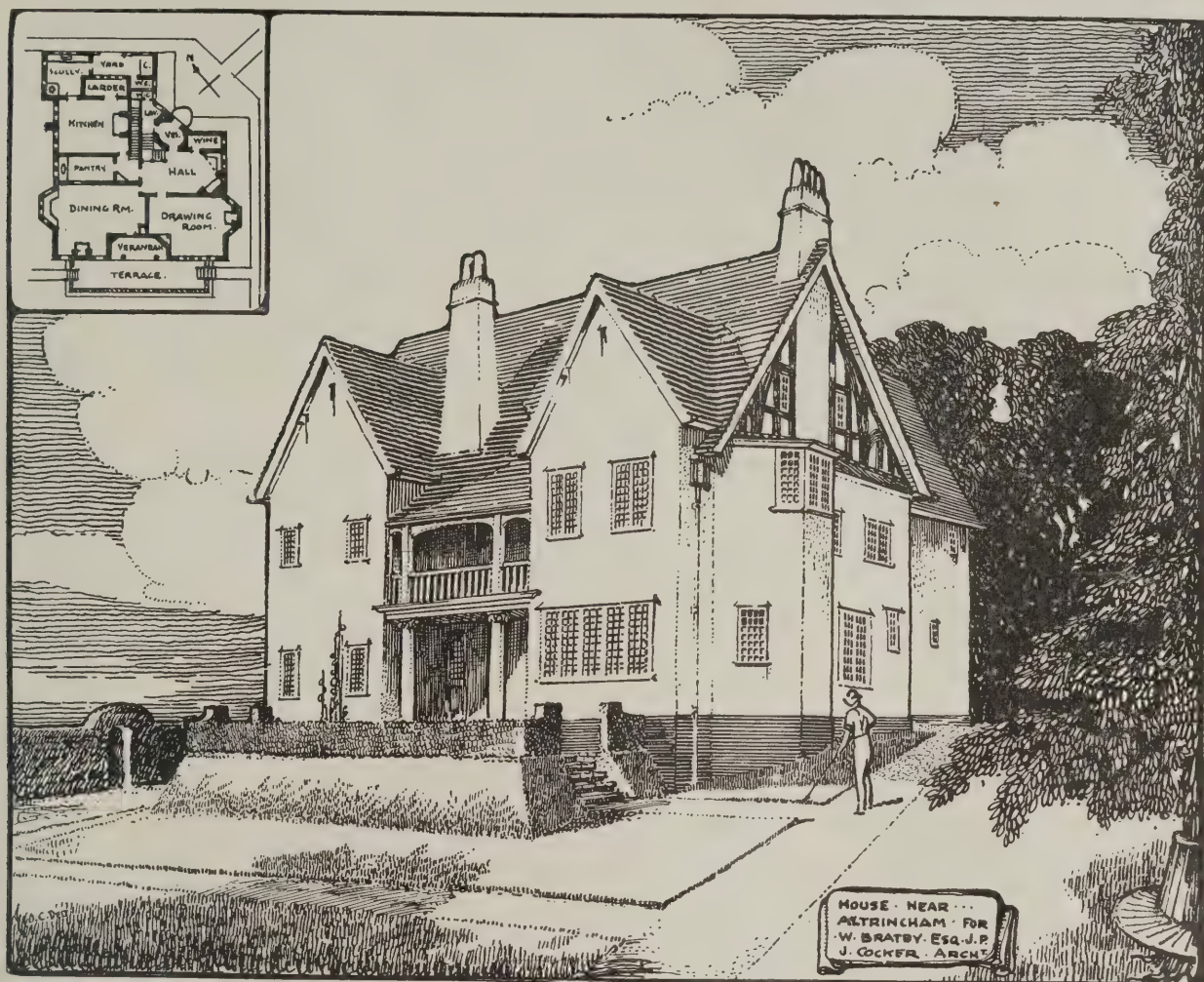
Count Sacconi, the architect of the national memorial to King Victor Emmanuel, now nearing completion, on the Capitoline Hill at Rome, died suddenly at Pistoia last Sunday.

Mr. W. G. Scott, head of the firm of Messrs. W. G. Scott & Co., architects and surveyors, of Workington, who died on April 29th last, aged 67 years, left estate which has been proved at £5,080 gross.

The late Mr. Alfred Waterhouse, R.A., died worth £163,575. He bequeathed Yattendon Court to his widow, with an annuity of £3,000 a year and the income of a special fund. Subject to her interest, the property is devised to the testator's eldest son, Mr. Paul Waterhouse, for life and to his sons in tail. After certain pecuniary legacies to relatives and to pupils and assistants, the residue of the estate is divided among the testator's four children in the proportion of one share to the eldest son and two shares each to his brother and sisters.

Comparative rubbing test between "Ringborg green" and Italian "Blanc clair" marble.

No.	Test piece.			Specific gravity.	Load, kilos.	Wear (rubbing off) after 200 revolutions with 35 cm. radius.		Wear, reduced to 49 cm. radius.		
	Mark.	Height, cm.	Length and width, cm.			Weight, grms.	Cubic cm.	Weight, grms.	Cubic cm.	
23001	1	2'50	10'04 by 10'04	2'7	30'0	54'5	20'2	74'4	27'5	"Ringborg green" marble from the quarries of Nya Marmorbruksaktiebolaget.
23002	2	2'49	10'04 by 10'00	2'7	30'0	51'5	19'0	70'3	26'0	
Average value - - -						53'0	19'1	72'4	26'8	
23003	1	2'50	10'04 by 10'01	2'7	30'0	64'0	23'7	87'3	32'3	Italian "Blanc clair" marble.
23004	2	2'46	10'07 by 10'07	2'7	30'0	64'5	23'9	88'0	32'6	
Average value - - -						64'3	23'8	87'7	32'5	



This house has been built of pressed red bricks, rough-cast, and tiled roof, from designs by Mr. James Cocker, architect and surveyor, of Altrincham. It occupies a commanding site.

AMERICAN ADDRESSES.

AN elegant reprint has just reached us from Washington giving the addresses delivered at the annual dinner of the American Institute of Architects at the beginning of this year. Dinner speeches on architecture do not often form good reading, however much the *bon mots* may be appreciated after the dessert, but in the present instance quite a number of interesting remarks seem to have been made. Mr. Roosevelt was there, but his speech was of no particular moment, its theme being the familiar one about having important Government work carried out steadily, to a plan devised by a body of capable men. Dr. Butler, president of Columbia University, followed with a speech on the place of art in civilization. "We are," he said, "a young people and art is old. To the country of Inigo Jones and Wren and Vanbrugh we owe much, for it is a country of home-builders of extraordinary excellence and skill. To the great exemplars of the Gothic, wherever found, we owe much. To the fine imagination, delicate technique and the broad architectural scholarship of the French we owe still more. But back of all we go, and must always go, to the eternal well-springs that were fed by the genius of Greece and Rome. It was given to them to create the highest standards of excellence alike in architecture, in sculpture and in letters, and to those standards it has been the effort of all intelligence ever since to conform. In this movement France has pointed the way for all of us. . . . The Ecole des Beaux-Arts has influenced us mightily. Of our earlier giants Richard Hunt and Richardson

came under its influence,* and the name of those who have followed them is legion. It was a Frenchman who took so large a part in the decoration of the public library at Boston, and it was a Frenchman who planned this capitol city with all its infinite possibilities of beauty, and who, at Hamilton's invitation, directed the laying-out of a typical industrial centre which national legislation was to foster and build up. . . . It is my privilege to present to this company His Excellency the French Ambassador."

The French Ambassador in the course of his reply asked how it was that French art had survived throughout the years and was so vital and alive in all its branches to-day. "Because it is alive in all the nation. The thing which is most important is that the artists are not enough; you must have the nation with you. . . . The French people of the poorer class are asked what they think. No great change is introduced in our architectural arrangements without giving the people an opportunity to see it and express their feelings. When there was a question of changing the Arc de l'Etoile by placing a group of statuary on its summit a model was made at great expense and placed in position

* A competent critic has furnished this note: "Hunt was the first American student to enter the Ecole des Beaux-Arts; Richardson the third. Hunt was the pioneer, the ice-breaker, the dean of our profession. He had been in Paris for years when Richardson arrived. Richardson was a strong and able man, an artist and a man of genius. On leaving Paris, early in life, he quarrelled with his classic *alma mater*; and being impatient of her methods, which he found too slow and laborious, he coined for himself a style eclectic, personal and romantic—Gothic in spirit, Romanesque in detail—robust, virile, ingenious, but wholly barbaric; remarkable for its absence of proportion and sense of real beauty; in the hands of his followers lawless, and now happily extinct."

for several months in order that the people might see the effect of the proposed alteration. They thought that it was better to remove the statues, and they were removed. For this cause all our museums are thrown open to all comers. . . . The same is true with our competitions. The exhibition of the competitive work for the Prix de Rome is open to all comers; the award is rendered by the highest authorities, members of the Institute; but the people's opinion is of importance. . . ."

Cardinal Gibbons dealt with "Art and Religion," but as that is a subject on which so much has been said at one time and another we pass it by, simply noting that His Eminence managed to drag in General Sheridan's joke about the pension office at Washington. "That building," he said, "has only one defect. It is fireproof."

The rest of the speakers, though distinguished men, said nothing which is worth recording for the benefit of English readers: but the foregoing is interesting as an indication of the growth and outlook of American architecture.

Sculpture at Liverpool.—In consequence of the inability of the Liverpool Arts Committee to comply with certain stipulations of the newly-formed Society of British Sculptors, there has been a kind of boycott of the thirty-fifth autumn exhibition of modern art, organized by the corporation and now open, by many distinguished sculptors. Notwithstanding these conspicuous abstentions, there is in the exhibition a fairly good selection of chisel-work, notably a brilliant example by Rodin.

OLD NORMANDY.

PERHAPS one of the oldest and most interesting towns in Normandy is Lisieux, full of quaint, narrow streets and picturesque groups of timber houses. Some of the finest of these latter are found in the Rue aux Fèvres, a delightful old street where neighbours can easily shake hands from the upper windows of some of the houses. Writing of Lisieux Mr. Percy Dearmer says: "In the Rue aux Fèvres we seem to be back in the Middle Ages; old houses nod across the narrow streets to each other, and children in their black blouses run in and out of the dark recesses. But how fallen is the street from its former glories! Old towns, with all their beauty, were doubtless not very clean; but the Rue aux Fèvres was not the filthy crumbling place it is now in the days when well-to-do burgesses lived in it and swept its doorways with their their costly gowns."

The splendid colour of these buildings, with the dark brown of the timbering and the yellowish green and red plasterwork, and the tumble-down brown and red tile roofs, is delightful.

The church of St. Pierre has a grand position in the large square of the town, and is a fine example of the early French style.

The church of St. Jacques (1496-1540) is also interesting. It is built on the natural slope of the ground, so that you walk uphill from the west door to the choir. The tower has not been completed, and the rather picturesque temporary roof covered with black slates still exists, while the painted decorations of the ceilings are in excellent preservation, having been discovered a short time ago under a heavy coat of whitewash.

About seven miles north west of Caen is the small village of Bretteville-Norrey, which can boast of an excellent church, built in the Early English period with a fine spire and open belfry and a most interesting north porch. Internally there is a sense of grandeur in the size and elegant proportions of the church, and there are many beautiful carvings. Externally, on either side of the chancel wall, rise two colombiers, or pigeon houses, the existence of which seem to indicate that this church originally belonged to the Abbey of Ardenne.

Competitions.

Schools, Newcastle.—Mr. Arnold Mitchell, F.R.I.B.A., will be the assessor in the competition for new schools in Bolam Street, Newcastle-on-Tyne.

New School at Reddish.—The competition for a new school at Reddish for the Stockport Education Committee has been decided as follows:—First premium, Messrs. Cheers & Smith, Blackburn; 2nd, Messrs. Winder & Taylor, Oldham; 3rd, Messrs. Adshead & Holt, Manchester. Mr. John W. Simpson, F.R.I.B.A., was the assessor.

OUR PLATES.

THE walls and ceiling of the interior of the council-chamber in Cardiff Town Hall are of painted plaster, and the panelling and seating of oak, with Italian marble columns. The seating accommodation is arranged in three tiers one above the other, while in addition to the lights shown in the illustration the room is lighted by a large side window, the glass of which it is proposed to fill with an architectural and allegorical design. Behind the Mayor's chair there is a recess, partially screened to form an anti-face. The opposite side of the chamber is occupied with the public gallery.

The council-chamber at Deptford is planned squarely, and is of considerably smaller dimensions than that at Cardiff. The building was opened a short time ago.

HOLLOW TERRA-COTTA PARTITIONS.

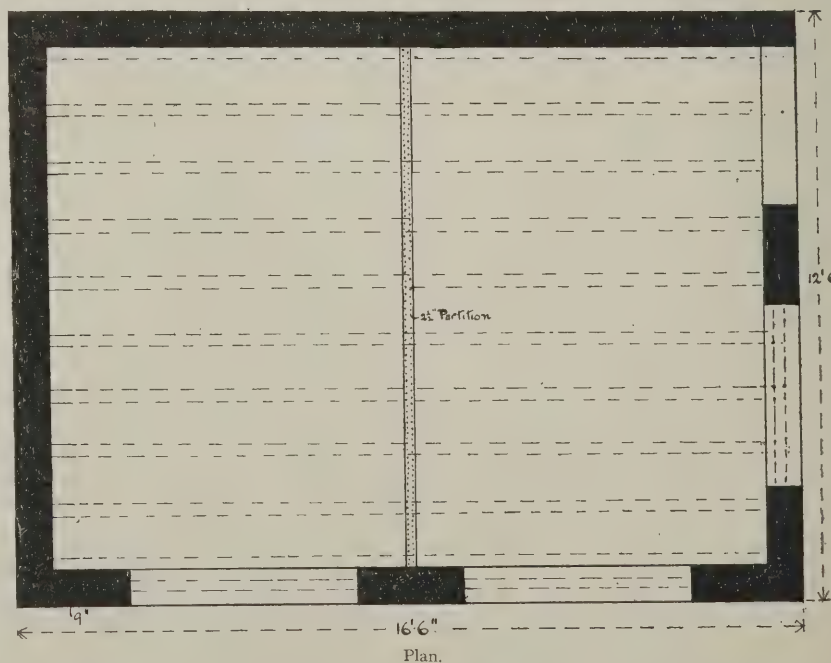
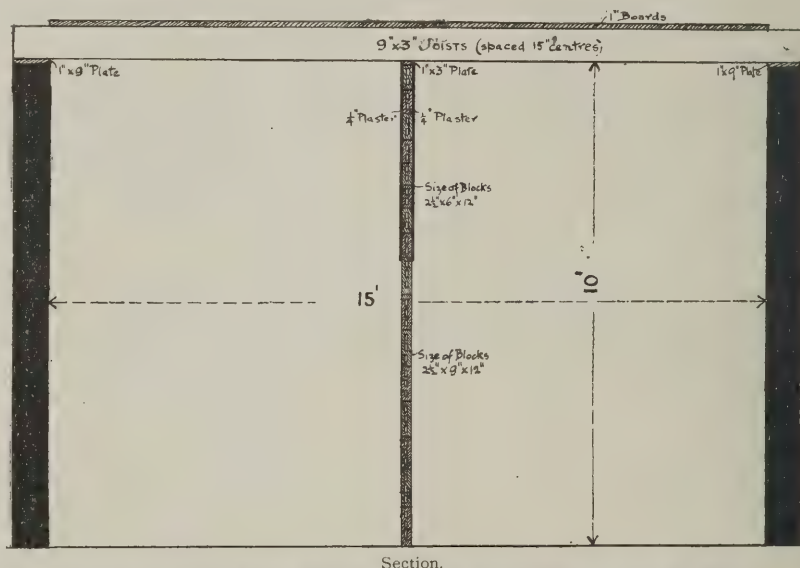
A Test to Determine their Strength.

WE publish herewith particulars and illustrations of a test recently carried out under our direction with the object of ascertaining the ability of a partition constructed of hollow terra-cotta fireproof blocks to sustain ordinary loads such as may be expected in practice. This test was on blocks manufactured by the Hempstead Patent Brick Co. at their works near Hemel Hempstead, Herts.

An office had been erected measuring 16ft. 6ins. by 12ft. 6ins. outside, or 15ft. by 11ft. inside, constructed as shown by the accompanying drawings and photographs, and across the middle a partition 10ft. high was erected with 2½in. bricks tailing in every other course in a chase in the brick walls on each side. A little over half the partition was constructed of blocks measuring 6ins. by 12ins. by 2½ins. thick, while the remaining top portion was constructed of blocks measuring 6ins. by 12ins. by 2½ins. thick. This latter portion was plastered on each side with ½in. of plaster made of liaslime and ashes; which was done for effect so as to show the finished surface ordinarily

given. The omission below was with the object of affording no ulterior support to the blocks. Joists gins. by 3ins., spaced 15ins. from centre to centre, were placed on wall-plates as shown in the section, and a plate 3ins. by 1in. was placed on the partition so as to distribute the weight equally. Boards 1in. thick were placed on the joists to allow the load to be put on.

The detail shows how these partition blocks are made hollow with three cavities in the 6in. blocks and two in the 12in. blocks. The mortar keys into these cavities, as shown in the detail, and a groove on the bed gives additional stability. The mortar used in this test partition was of crushed brick and Portland cement, in the proportion of 3 to 1. The remarkable resistance these blocks offer to very high temperature was dealt with in our issue for August 24th, 1904, in a report of a private fire test carried out specially for our particular information. The blocks weigh only 105 lbs. per yard, so that a partition is very light. It will be seen from the detail that the amount of material resisting stress in a block, taken at the weakest point, consists of two ¾in. skins, thus giving 1½ins. per inch run. The webs, however, give considerable stiffness and add strength.



THE TEST BUILDING WITH HOLLOW TERRA-COTTA BLOCK PARTITION.

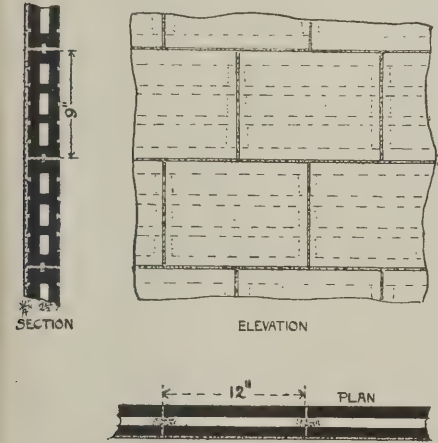
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In considering the amount of the load to which this partition should be subjected for a thorough proof of its reliability for general use in buildings we kept in view the following points:—A partition might be required to sustain the load from floor joists resting thereon and stretching from both sides. A partition thus loaded would be erected across a building in a similar manner to that in this test, namely, between the front and back walls of a building. It would be unfair to expect a partition of this small thickness to sustain loads in buildings other than the domestic class, or in the smaller offices in commercial buildings and schools, &c., and the size of most rooms would not exceed 12ft. by 20ft.; in such a case the joists, of course, would run the short way, namely, the 12ft. span. If rooms of a larger span were required it would be only fair to expect a heavier partition to be required. In fact, most builders would be chary of resting joists of this span upon a 4½in. solid brick partition. The load in a dwelling never exceeds 40 lbs. per sq. ft., and in schoolrooms 50 lbs. per sq. ft. is reckoned ample. These two factors, then, were taken



DETAIL OF CONSTRUCTION OF THE PARTITION.

as the limit, namely, a 12ft. span and a load of 50 lbs. per ft. super. The joists in such a case would not be continuous over the partition; and as the continuity of the joists increases the load on the central support by one-fourth, or 25 per cent., and reduces the load on the end supports by one-eighth each, the load in the test had to be correspondingly reduced. The desire being to introduce in the partition a stress equal to a load of 50 lbs. per ft. super. on joists of 12ft. span coming in from both sides, required that the load on a span of 7ft. 6ins. should be increased. As it is the practice of most engineers to allow a factor of safety of 10 in a brick wall, we thought it desirable to test the partition with a similar factor of safety, so as to leave no possibility of criticism, although we are inclined to think that such a large factor of safety is excessive because the load would seldom reach the maximum, and then not be continued for long.

On two 12ft. spans with a factor of safety of 10 the load on the partition would be $12 \times 50 \times 10 = 6,000$ lbs. per ft. run, or 500 lbs. per ft. super. on the floor. On two 7ft. 6in. spans with continuous joists in order to induce the same stress in the partition a load of 640 lbs. per ft. super. would be required. The floor was thus loaded without any difference being noticeable. When the load was removed it was found that both the joists and wall-plate over the partition were indented $\frac{3}{16}$ in. where they had rested against each other. The bricks used for giving the load weighed 7 lbs., some being an ounce under. Therefore the bricks were piled twenty-six courses high. As there are thirty-two bricks in each course to the yard, it will be seen the load was not under weight, and as it rained



2-IN. HOLLOW TERRA-COTTA PARTITION SUSTAINING DISTRIBUTED FLOOR LOAD OF 640 LBS. PER FOOT SUPER.

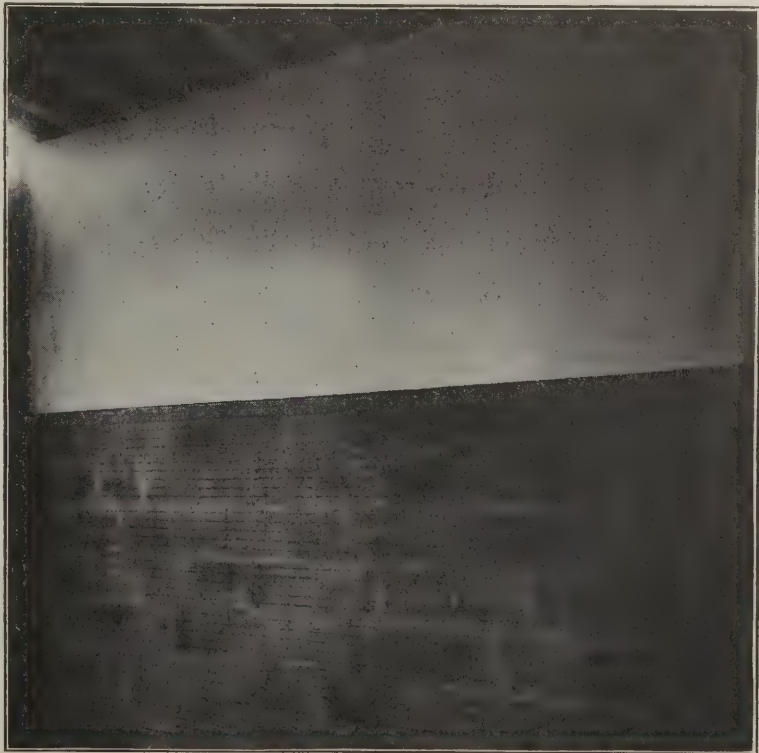
heavily for two days after the load had been applied the bricks must have gained considerably in weight.

When it is recollected that the amount of material resisting compressive stress is, as stated above, 1½ins. per inch run it will be seen how remarkable is the result, because with the load applied the stress per inch run was 625 lbs. Thus there was a fibre stress of 417 lbs. per sq. in. in the partition blocks at their weakest points. In the 1897 tests by the Royal Institute of British Architects walls of stock bricks built in lime-mortar crushed at a load of 290 lbs. per sq. in., and these partition blocks are porous terra-cotta capable of taking a nail. The 3in. partition blocks manufactured by the company give nearly double the area, so it may be anticipated that

these would take the heaviest load over the largest span likely to be met with in practice.

It will be seen, therefore, that these 2½in. partition blocks can be used with safety for ordinary rooms in houses, &c., and the ample factor of safety of 10 will allow for any possibility of inferior workmanship (although in this case the work was not out of the ordinary), and for differences of design. The height of 10ft. is as much as can be expected in ordinary rooms, and the factor of safety would allow for an increase in this direction also.

A German Garden City.—A syndicate has been formed to lay out a "garden city" at Wohldorf, a picturesque spot near Hamburg.



VIEW OF PARTITION SUSTAINING LOAD.



This house has recently been erected. The lower portion of the walls up to the window sills is faced with local grey stools with red quoins and patterns worked in; above this the facing is rough-cast. The roof is covered with hand-made tiles. The windows have Gibbons's steel casements and are fitted with plain lead glazing by Messrs. J. Chater & Sons. The staircase and screen are of oak, and the hall is panelled with oak to the height of 6ft. 6ins. Messrs. Tompsett & Co. were the builders and Mr. W. H. Ansell, A.R.I.B.A., of London, was the architect. The above view shows the garden front.

HOUSE AT FARNHAM SURREY. W. H. ANSELL, A.R.I.B.A.,
ARCHITECT.



THEORY OF SHEARING STRESSES IN MASONRY.

WHILE the action of shearing stresses in metals has been as fully recognized as that of tension and compression since the establishment of the theory of stresses in solid bodies, they have had practically no place in the rational treatment of masonry structures until the theory and tests of reinforced concrete beams compelled their recognition. In such masonry masses as suspension bridge anchorages, abutments of arches and even in retaining walls shearing stresses must always exist, and sometimes with comparatively high intensities. The same observation is certainly not less applicable to some portions of high masonry dams. In the latter case shearing stresses have always been allowed for under the head of "friction." In most of the standard treatments of high masonry dams one of the prominent conditions of stability has generally been so stated as to indicate that at no horizontal section of the dam shall the obliquity of the resultant pressure ever be greater than the angle of repose of masonry on masonry, the tangent of that angle being prescribed at about 0.6. Although that has been a general feature of practice in this particular line of construction it is thoroughly irrational, and it is rather strange that so many engineers have sanctioned it. As a matter of fact there is no horizontal joint in any properly built high masonry dam, and consequently there can be no possible action of friction until such a joint is made. Hence, before friction can act, an

approximately horizontal joint or surface of action must be made by shearing the masonry along that surface. The actual condition resulting from that provision of a specification is the virtual requirement that masonry shall possess a shearing resistance not less than about 0.6 of the resultant normal pressure, and there is little or no first-class masonry used in high masonry dams at the present time which will not fully meet this requirement.

The Idea Scouted.

In spite of these conditions a considerable number of engineers experienced in large masonry works have, in the past, not only declined to recognize the shearing resistance of masonry, but have asserted that its existence was too uncertain to make it desirable to give it any value. No less an authority than the late Mr. G. Bouscareau, about ten years ago, treated with contemptuous jocularly the suggestion that shearing should be considered in a mass of anchorage masonry for a proposed large stiffened suspension bridge. Yet it may be stated with perfect truthfulness and without the least exaggeration that no mass of masonry, and especially no plain or reinforced concrete beam, could stand under severe duty unless its shearing resistance were a large proportion of its compression resistance.

There are few tests of either natural or artificial stone in compression whose results do not furnish a remarkably accurate basis for computing the ultimate shearing resistance. Indeed, the so-called failures by compression of cubical or cylindrical test

specimens of nearly all good building stones, whether natural or artificial, are actually shearing failures. Those who have conducted compression tests of stone have many times observed the interesting forms in which the fragments are separated in the fractured specimens. Wedge-shaped pieces are usually sheared off along planes making angles of about 45 degs. with the direction of the applied loads, precisely as the theory of stresses in solid bodies indicates that they should. The manner of holding test pieces prevents these shearing planes from making the exact angle of 45 degs., which theory indicates to be the angle of maximum shearing intensity, but the divergence is small. The crucial fact is the failure by shear, although the maximum test load is recorded in pounds per square inch of compression. It is this persistent neglect to record the failure under its true name which has so long obscured the perfectly obvious action of shearing stresses in masonry.

Demonstration by Analysis.

The primary principles of analysis of tension and compression in any material indicate that shearing stresses exist with varying intensities throughout the entire volume of the piece. An analysis equally clear and but little less simple demonstrates that shearing stresses also exist throughout the entire mass of a beam carrying a transverse load. In other words, every masonry beam, including those of natural stone or concrete, whether reinforced or not, must frequently sustain shearing stresses of comparatively high intensity. At the ends of simple supported beams these intensities of shear are sometimes so high that they cause failure. In some recent tests of reinforced concrete beams this failure by end shearing was stated to be a failure by compression in the authentic accounts of the tests. The prevailing obscurity as to shearing stresses in masonry led to erroneous views as to the cause of failure, and the statement was fortified by the observation that the pulverization of the failed material proved the failure to be one of compression. A little experience only is required in testing blocks or cylinders of stone to show that the failed material is always finely divided along the plane or surface of ultimate shearing. The movement of two masses of stone on each other along a sheared surface is bound to pulverize the material. If the stone is weak there may be a large amount of the pulverized material, and often the greater part of the test specimen is demoralized in this manner.

Furthermore, it is known that the neutral surface of a bent beam is subjected to the greatest intensity of shear in the entire beam, that intensity having its maximum value at the ends. Every section of the beam parallel to the neutral surface is also subjected to shear, but with a less intensity than that of the neutral surface. Finally, every transverse section of a concrete beam is subjected to a shear with an intensity at the neutral axis equal to one and a half times the mean.

Conclusions.

These considerations show conclusively that the shearing stresses in every masonry mass and in every stone or concrete beam play a part not less important than that of the compressive stresses. They show, further, that the intensities of these shearing stresses may be subject to computations practically as exact as those which determine compressive intensities. It is obvious, therefore, that the ultimate shearing resistances of various grades of masonry and stone should be as carefully determined by tests as those of compression, and, finally, that the consideration of shearing stresses should govern the design of masonry structures with just as much force and completeness as the consideration of the stresses of compression.—"Engineering Record."

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :			
Sept. 28	Basford- Depot	Health Committee	A. Brown, City Engineer, Nottingham.
" 28	Churwell-Houses	E. Stanhope	T. A. Buttery & S. B. Bird, Architects, Queen Street, Morley.
" 28	Bexley Heath-New Wing	Committee of Foresters' Homes	J. S. Paul & Son, 31 Bedford Row, W.C.
" 28	Halifax-Villas		G. Buckley & Sons, Architects, Tower Chambers, Halifax.
" 29	Warrington-School	Committee	S. P. Silcock, Architect, Egypt Street, Warrington.
" 29	Newcastle-upon-Tyne-Pavilions	Sanitary Committee	City Property Surveyor's Depart., Town Hall, Newcastle-upon-Tyne.
" 29	Burrington-Residence	H. Embery	R. S. Hookway & Son, Architects, 12 Bridgeland Street, Bideford.
" 30	Porth-Villas		20 Cemetery Road, Porth, Wales.
" 30	Barrow-in-Furness-Cottage Homes	Guardians	H. T. Fowler, Architect, Cornwallis Street, Barrow-in-Furness.
" 30	Rhyl-Library	Urban District Council	A. A. Goodall, Surveyor, Council Offices, Rhyl.
" 30	Carlisle-Cloakroom	Education Committee	J. Forster, M.S.A., The Courts, Carlisle.
" 30	Wheatley-School	Education Committee	J. Vickers Edwards, County Architect, County Hall, Wakefield.
" 30	Londonderry-Barrack		J. P. M'Grath, Architect, Commercial Buildings, Foyle St., Londonderry.
Oct. 30	Llanbythter-Sanatorium	Committee	E. Collier, Architect, 4 Quay Street, Carmarthen.
" 2	Beaufort-Disinfecting Buildings	Urban District Council	S. J. Thomas, Surveyor, Ebbw Vale, Monmouth.
" 2	Bowness-School	School Board	G. Smellie, Taylor & Browne, 167 St. Vincent Street, Glasgow.
" 2	Stokeinteighhead-Farmhouse	G. Nickels	Back, 4 Victoria Street, Totnes.
" 3	Wigton-House, &c.		J. L. Wilson, 2 South Terrace, Wigton.
" 3	Harrington-Villa	H. Beattie	W. G. Scott & Co., Architects, Victoria Buildings, Workington.
" 4	Taunton-Schools	Education Committee	Bryan & Roberts, 2 Hammet Street, Taunton.
" 4	Harrogate-Post Office Enlargement	H.M. Office of Works	H. G. Nixon, H.M. Office of Works, Infirmary Street, Leeds.
" 4	Sutton-Office	Metropolitan Asylums Board	S. Dinwiddy & Sons, Architects, 54 Parliament Street, S.W.
" 4	Homerton-Superstructure	Guardians	F. R. Coles, Clerk's Offices, Hackney Union, Homerton, N.E.
" 5	Sunderland-School	Town Council	Vaux & Mark, Architects, 66 John Street, Sunderland.
" 7	Eastbourne-Fire Station	Corporation	Borough Surveyor's Office, Town Hall, Eastbourne.
" 7	Pontypridd-Alterations	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
" 9	Mortlake-Addition to Hospital	Urban District Council	G. Bruce Tones, Surveyor, Council Offices, Mortlake.
" 9	Bournemouth-Shelters, &c.	Town Council	F. W. Lacy, M.I.C.E., Municipal Offices, Bournemouth.
" 10	Northwich-School	Education Committee	A. E. Thomas, Clerk, Education Offices, Northwich.
" 10	Blackfriars-Power Station	H.M. Office of Works	J. Wagner, H.M. Office of Works, Westminster, S.W.
" 10	Twickenham-Repairs to Mansion	London County Council	Architect's Department, 15 Pall Mall East, S.W.
" 16	Preston-School	Education Committee	Education Offices, Preston.
" 16	London, S.W.-Baths	Borough Council	Council House, East Hill, Wandsworth, S.W.
" 27	Lewis-Police Offices, &c.	County Council	F. J. Wood, County Surveyor, Lewes.
ENGINEERING :			
Sept. 28	Tula, Roumania-Water-supply	Municipality	Municipal Offices, Tula.
Oct. 2	Westerham-Pumping-engine	Metropolitan Water Board	District Engineer, Brookmill Road, Deptford, S.E.
" 2	Clay Cross-Filter-beds, &c.	Urban District Council	W. H. Radford, C.E., Albion Chambers, King Street, Nottingham.
" 3	London, N.E.-Boilers	Metropolitan Asylums Board	Metropolitan Asylums Board, Embankment, E.C.
" 9	Liege-Extension of Water Conduit	County Council	A. Halleux, C.E., 74 rue Fabry, Liege.
" 10	London-Reconstruction of Bridges		M. Fitzmaurice, Chief Engineer, County Hall, Spring Gardens, S.W.
" 10	Alexandria, Egypt-Quays	Urban District Council	Director-General of Harbours and Lighthouses, Alexandria.
" 16	Horsforth-Borehole Pump	Urban District Council	E. J. Silcock, M.I.C.E., 10 Park Row, Leeds.
" 16	Horsforth-Gas-engine	Urban District Council	E. J. Silcock, M.I.C.E., 10 Park Row, Leeds.
" 23	Mussoorie, India-Electric Lighting and Waterworks Scheme.	Municipality	C. H. Shanani, Municipal Office, Mussoorie, India.
Nov. 9	Havana-Pier		Cuban, Consulate London.
IRON AND STEEL :			
Oct. 9	Mussoorie, India-Pipes, &c.	Municipal Board	C. H. Shanani, Municipal Office, Mussoorie.
" 20	Southall-Fencing, &c.	Urban District Council	R. Brown, Engineer, Public Offices, Southall.
PAINTING AND PLUMBING :			
Sept. 30	Cardiff-Painting at Workhouse	Guardians	A. J. Harris, Clerk, Union Offices, Queen's Chambers, Cardiff.
ROADS AND CARTAGE :			
Sept. 28	Romford-Materials	Urban District Council	Surveyor, Council Offices, Romford.
" 28	Enfield-Making-up	Urban District Council	R. Collins, Surveyor, Public Offices, Enfield.
" 28	Grays-Macadam	Urban District Council	A. C. James, Surveyor, Grays, Essex.
" 28	London, N.W.-Wood Paving	Hampstead Borough Council	O. E. Winter, A.M.I.C.E., Town Hall, Hampstead, N.W.
" 28	Saltash-Stones and Gravel	Urban District Council	Borough Surveyor, Guildhall, Saltash.
" 29	Hitchin-Granite	Urban District Council	W. Onslow Simes, Clerk, Town Hall, Hitchin.
" 30	Newburn-on-Tyne-Making-up	Urban District Council	S. Gregory, Surveyor, Newburn-on-Tyne.
" 30	Swanage-Making-up	Urban District Council	T. Randell, Clerk, Town Hall, Swanage.
Oct. 2	London, S.E.-Kerbing, &c.	Lewisham Borough Council	Surveyor's Department, Town Hall, Catford.
" 2	Sevenoaks-Granite, &c.	Urban District Council	S. Fowlson, Surveyor, Argyle Road, Sevenoaks.
" 4	Wanstead-Making-up	Urban District Council	Council Offices, Wanstead, N.E.
" 4	Watford-Granite	Urban District Council	H. Morten Turner, Clerk, 14 High Street, Watford.
" 6	Cradley Heath-Road Works	Urban District Council	Council Offices, Lawrence Lane, Old Hill, Staffs.
SANITARY :			
Sept. 29	Ovingham-Sewage Works	Rural District Council	J. H. Nicholson, Clerk, Midland Bank Chambers, Hexham.
Oct. 30	Walmer-Removal of Refuse	Urban District Council	Surveyor, Council Offices, Walmer.
" 2	Dartford-Sewer, &c.	Rural District Council	W. Harston, A.M.I.C.E., 8 Hythe Street, Dartford.
" 4	Watford-Sewerage Works	Urban District Council	Council Offices, High Street, Watford.
" 4	Watford-Sewer Pipes	Urban District Council	Council Offices, High Street, Watford.
" 9	Alnwick-Relaying Sewer	Rural District Council	H. W. Walton, Clerk, Council Offices, Alnwick.
" 9	Pontypridd-Drains	Urban District Council	P. R. A. Willoughby, A.M.I.C.E., Council Offices, Pontypridd.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Oct. 9	London-Shop Fronts	£75	—	W. H. Smith & Sons, 186 Strand, W.C.
" 16	Preston-School	£50, £30 and £20	—	Director of Education, Education Offices, Preston.
Nov. 4	Maesteg-Chapel		—	W. Job, Llynir Lodge, Maesteg, Wales.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

The Architectural Review.

Edited by MERVYN E. MACARTNEY.

The September issue now on Sale at all Bookstalls and Newsagents.

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"REDCOURT," HASLEMERE. PORCH TO THE WINTER GARDEN.
ERNEST NEWTON, ARCHITECT.

Photo: E. Dockree.

CONTENTS OF THE SEPTEMBER NUMBER.

- ENGLISH LEAD PIPE-HEADS. II. Lawrence Weaver, F.S.A. With 14 Illustrations.
- THE RESEARCHES OF MR. WILLIAM HENRY GOODYEAR. L. Ingleby Wood. With Three Illustrations.
- THE CHEAP COTTAGES EXHIBITION. I. H. Kempton Dyson. With Four Illustrations.
- THE PEACE PALACE AT THE HAGUE. Conditions, Plan, and View of the Site. Illustrated.
- A SKETCH OF IRISH ECCLESIASTICAL ARCHITECTURE. III.—Vaults, Arches, and Chancels. A. C. Champneys. With 16 Illustrations.

- THE OWNERSHIP OF ARCHITECTS' PLANS. A. F. Topham, Barrister-at-Law.
- CURRENT ARCHITECTURE. With 19 Illustrations—
- "Redcourt," Haslemere. Ernest Newton, Architect.
- A Week-end Cottage, Great Missenden. Timothy Honnor, Architect.
- Holy Trinity Church, Kensington. G. F. Bodley, R.A., Architect.
- Panelling and Carving formerly in Winchester College Chapel; now fitted in the Hall at Hursley Park. Attributed to Grinling Gibbons.

TECHNICAL JOURNALS, Ltd., Great New Street, Fetter Lane, E.C.

Trade and Craft.

Obstruction in Drains.

Everyone knows the trouble that is constantly caused by the stoppage of drains, due to the introduction of foreign matter, the ignorance of the British public being very great on this subject, especially among the lower classes. Such articles as stones, bricks, brushes, tins, ashes, &c., are frequently emptied down the drains. The method often adopted by the workmen employed by small builders is to use a plunger pump, which, instead of repairing the mischief by the removal of the object, often makes matters worse by forcing the obstruction further down the pipe or drain, until finally it becomes choked altogether, and nothing can then be done but to take up the drain or cut away the portion of the pipe affected. Messrs. Burn Brothers, of 3, Blackfriars Road, and 6A, Stamford Street, S.E., sell a very useful implement which is greatly in advance of the ordinary plunger. This is Cooper's patent suction and vacuum pump, which will suck foreign matter away in a surprising manner. Anything that can pass down the drain can be withdrawn by this pump, which cannot be used as a plunger. The pump is operated by short rapid strokes, so that the periphery on the rubber sucker is not raised from the surface surrounding the orifice of the gully, pipe or waste under treatment. To clear a pipe the pump is placed upon the opening and covered with water. If there is a ventilating pipe it must be temporarily plugged. It is a very useful addition to the many admirable appliances made by Messrs. Burn Brothers for the testing and clearing of drains, for which this firm has achieved a reputation. Two other interesting appliances have recently been placed on the market by Messrs. Burn Brothers, namely, the Ridgeless patent spring pipe bender, upon which lead pipes can be dressed without forming spiral ridges on the bore, which cannot be done without damage on a spring formed of round section wire. The other appliance is the Ferret patent spring drain cleaner, which consists of spirally wound wire that is very flexible and yet stiff enough to remove obstructions easily.

"True-scale" Reproductions of Drawings.

Side by side with the old blue print which once held an exclusive position in architects' and engineers' offices a number of other processes have come into vogue. They are not new processes, but well-known ones which have been exploited by trade firms in response to the demand for facsimiles of drawings. Each of these processes has its merits and defects, either as regards the quality of the result or the cost of it, but it is not our intention now to attempt any comparison of them, as some months ago we went carefully into the matter and fully described the features, methods of working and cost of the several kinds of prints. For the moment we wish to draw attention to the process of which Messrs. Vincent Brooks, Day & Son, Ltd., make a speciality. This is called "True-scale" photo-lithography, and its particular merit is, as the name implies, the absolute exactness in scale which is secured; while, being in printing ink, the copies are quite permanent. In these matters we see no reason why trade firms should foster secrecy about their methods and cloak them round with mysterious phraseology. As far as we know this "True-scale" process is nothing more than photo-lithography on aluminium instead of on stone; the use of the aluminium being a matter of convenience to the printers rather than effecting any improvement in the print; but we understand that instead of the usual transfer the sensitized aluminium sheet is printed upon through a paper negative of the original, and this is where the special merit of the process comes in, for the print is not wetted in any way,

and consequently it keeps absolutely true to scale; with processes in which the print is immersed in water or other liquid there is the possibility of expansion, and cases might often arise where the slightest defect of this nature would render the print useless for practical purposes. It is to be noted also that papers which have been sensitized with some sort of gum as a ground are apt to produce slightly blurred lines, which is another defect. This "True-scale" process, then, being eminently satisfactory in result, the whole question resolves itself into one of cost. Here the number of prints required governs the situation, for the cost of the first print by this "True-scale" process is comparatively high, though subsequently copies are proportionately cheap. For example, the charge for a single print on an imperial sheet is 7s. and additional copies only 1s. each. The firm's price for similar sized sepia or gallic prints is 2s. each. Hence, if six copies were required the cost would be the same in each case, and there is no question as to the superiority of the "True-scale" process. Messrs. Vincent Brooks, Day & Son supply a little pamphlet giving samples of their work on paper, linen and tracing cloth, and we advise all who are interested to write for a copy. The firm's address is 48, Parker Street, Lincoln's Inn Fields, W.C.

Dovetail Sheet Construction.

We have received a new catalogue just issued by the Fireproof Co., Ltd., of 10, York Buildings, Adelphi, W.C., dealing with their dovetailed corrugated system of fire-resisting construction. This system is well-known, and its many advantages have been widely recognized. The chief feature is the use of sheets rolled into a dovetail corrugation, which offers an excellent key for plaster or concrete. By the use of these sheets thin partitions can be erected that have great rigidity and strength. The sheeting is manufactured of a special gauge steel sheet in three sections, namely—(1) Deep, $\frac{7}{16}$ in. deep; (2) shallow, $\frac{7}{16}$ in. deep; (3) extra shallow, $\frac{3}{16}$ in. deep.

Deep sections are made and stocked in the following sizes:—

Width.	Length.
3ft.	× 3ft. 4ins.
2ft. 6ins.	× 3ft. 4ins.
2ft. 6ins.	× 3ft. 4ins.
2ft. 6ins.	× 3ft. 4ins.
2ft.	× 3ft. 4ins.

For the erection of a partition all that is necessary is to fix to the ceiling (whether wood joists, concrete or other substance) a T section iron, by means of special pattern

hooks, and immediately under, on the floor, channel section shoes about 4ins. long, these being placed under each H upright. The H uprights $1\frac{1}{4}$ ins. by $1\frac{1}{4}$ ins. by $\frac{1}{2}$ in., or $1\frac{3}{4}$ ins. by $1\frac{1}{4}$ ins. by $\frac{1}{2}$ in., according to the height of the partition, are spaced according to the width of the sheeting being used. The H bar is slotted at one end in order to engage with the T bar fixed to ceiling. Between the flanges of H uprights are placed the dovetail corrugated sheets. The sheets being 3ft. 4ins. long, necessarily butt joint at intervals; each of these joints (on one side only of the partition) is clipped to the next with a small joint clip which prevents any likelihood of the sheets dropping with the weight of the wet plaster. To effect a tie from end to end of the partition hoop-iron bands, in. by 18 B.W.G., are employed from the H to H uprights alternately on either side of the partition about midway of the height (unless a high partition, then two ties in the height). These bands should not be placed on too tightly, but just sufficiently to act as a tie to the partitions.

Where a partition finishes against a wall, a channel upright is used and fixed to the wall by clout nails spaced about 3ft. apart. Where one partition forms a corner with another an H and a channel section-bar are used conjointly, the two uprights being jointed together with clips of in. by 18 B.W.G. hoop-iron. All other applications have been satisfactorily solved and are fully explained with drawings in the catalogue.

Coming Events.

Saturday, September 30.

NORTHERN ARCHITECTURAL ASSOCIATION. — Students' Sketching Club Excursion.

INSTITUTE OF SANITARY ENGINEERS. — Visit to Associated Portland Cement Manufacturers' works at Northfleet, at 3.20 p.m.

Wednesday, October 4.

KING'S COLLEGE, LONDON. — Course of Training for Sanitary Inspectors in Building Construction commences.

New Companies.

W. SMITH (FARNBOROUGH), LTD., to acquire the business of builders and contractors, &c., carried on at Farnborough by W. Smith. Capital: £5,000.

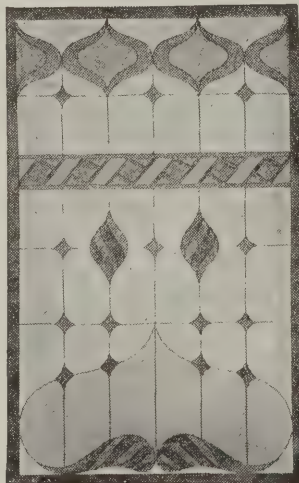
DART AND FRANCIS, LTD., to acquire the business of builders and contractors lately carried on at Crediton and elsewhere by W. Dart and S. B. Francis. Capital: £10,000.

WAIN'S, LTD., to acquire the business of brick manufacturers carried on by W. A. Wain and T. B. Wain at the Brickworks, Heather, Leicestershire. Capital: £5,000.

GRANITES, LTD., to acquire the agency and business carried on by G. Briggs at 25, Victoria Street, S.W., and elsewhere, and to carry on the business of granite, stone, concrete, cement, brick, tile and building material agents, manufacturers and dealers, &c. Capital: £20,000.

"CLOISONNE GLASS" WEATHER RESISTING.

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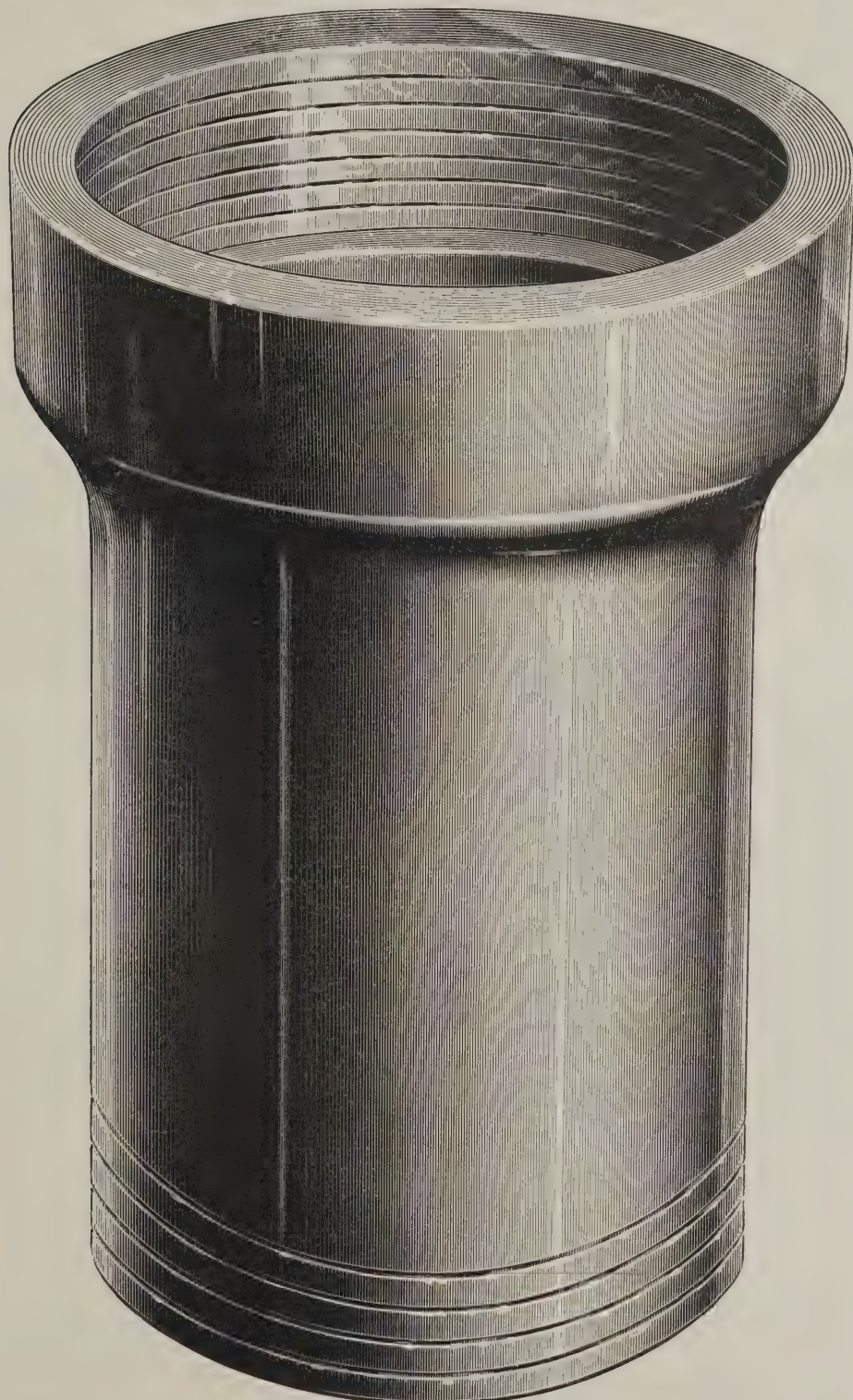


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E. BROOKE & SONS, HUDDERSFIELD. Telegrams: "FIELDHOUSE." Nat. Tel. 109.

London Address: 2 and 3, Norfolk Street, Strand, W.C.

Current Market Prices

FORAGE.			
Beans ...	per qr.	£ 1 10 0	£ 1 12 0
Clover, best ...	per load	3 12 0	4 0 0
Hay, good ...	do.	3 3 0	3 10 0
Sainfoin mixture ...	do.	3 7 0	3 15 0
Straw ...	do.	1 10 0	1 18 0

OILS AND PAINTS.			
Castor Oil, French ...	per cwt.	1 3 11	1 6 3
Colza Oil, English ...	do.	1 2 9	—
Coppers ...	per ton	2 0 0	—
Lard Oil ...	per cwt.	2 15 0	2 17 0
Lead, white, ground, car-	per ton	16 0 0	—
bonate ...	do.	15 0 0	0 19 0
Do. red ...	per cwt.	0 15 9	—
Linseed Oil, barrels ...	per gal.	0 0 5 ⁷ / ₈	0 0 6
Petroleum, American ...	do.	0 0 5 ⁷ / ₈	—
Do. Russian ...	per barrel	0 8 0	—
Pitch ...	per barrel	9 0 0	—
Shellac, orange ...	per ton	3 2 6	3 5 0
Soda, crystals ...	per cwt.	1 4 0	1 5 3
Tallow, Town ...	per barrel	1 5 0	—
Tar, Stockholm ...	per cwt.	2 8 0	—
Turpentine ...	per ton	84 0 0	—

METALS.			
Copper, sheet, strong ...	per ton	84 0 0	—
Iron, Staffs, bar ...	do.	6 0 0	8 0 0
Do. Galvanized Corru-	do.	11 10 0	11 15 0
gated sheet ...	do.	13 16 3	13 17 6
Lead, pig, Soft Foreign ...	do.	14 3 9	—
Do. do. English common	do.	15 0 0	—
brands ...	do.	16 0 0	—
Do. sheet English, 3lb.	per sq. ft. and upwards	15 0 0	—
per sq. ft. and upwards	do.	16 0 0	—
Do. pipe ...	do.	9 5 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 0 0	—
Do. floor brads ...	do.	5 7 6	5 12 6
Steel, Staffs, Girders and	do.	6 0 0	6 5 0
Angles ...	do.	145 12 6	146 2 6
Do. Mild bars ...	do.	147 0 0	148 10 0
Tin, Foreign ...	do.	29 0 0	—
Do. English ingots ...	do.	29 10 0	—
Zinc, sheets, Silesian ...	do.	26 17 6	27 2 6
Do. do. Vieille Montaigne	do.	—	—
Do. Spelter ...	do.	—	—

TIMBER.			
SOFT WOODS.			
Fir, Dantzic and Memel	per load	2 12 6	5 0 0
Pine, Quebec, Yellow ...	do.	4 0 0	7 10 0
Do. Pitch, American ...	do.	3 3 0	5 0 0
Laths, log, Dantzic ...	per cu. fath.	4 0 0	6 0 0
Deals, Skelleftea, Yel-	per std.	9 5 0	—
low, 5th, 4x9	do.	6 15 0	—
Do. do. do. Unsorted,	do.	10 15 0	—
3x9	do.	8 10 0	—
Do. Abyn, Yellow, 1st	do.	17 10 0	—
and 2nd, 4x9	do.	10 0 0	—
Do. do. do. 4th, 4x9	do.	10 0 0	—
Do. Lewisport, Yellow	do.	10 0 0	—
Pine, 1st, 3x9	do.	8 0 0	—
Do. Onega, Yellow,	do.	12 0 0	—
3rd, 3x9	do.	10 0 0	—
Do. do. do. 4th, 3x9	do.	10 0 0	—
Do. Archangel, Yel-	do.	6 10 0	—
low, 2nd, 3x9	do.	16 10 0	—
Do. do. do. 3rd, 3x9	do.	8 10 0	—
Do. do. do. 5th, 3x9	do.	10 0 0	—
Do. Skutskar, Yellow,	do.	10 0 0	—
Dry Mixed, 3x9	do.	8 10 0	—
Do. Stockholm, Yel-	do.	10 0 0	—
low, Unsorted, 3x8	do.	9 15 0	—
Do. Botwoodville, Yel-	do.	15 0 0	—
low, 2nd, 3x8	do.	8 0 0	—
Do. do. do. 3x7	do.	8 0 0	—
Do. Kem Yellow, 1st,	do.	8 0 0	—
3x8	do.	8 0 0	—
Do. Norrkoping, Yel-	do.	8 0 0	—
low, 1st & 2nd, 3x7	do.	8 5 0	—
Do. Pernoviken, Yel-	do.	7 15 0	—
low, 1st & 2nd, 2x8	do.	8 15 0	—
Do. St. Petersburg,	do.	8 0 0	—
Yellow, 3rd, 2x8	do.	8 0 0	—
Do. do. do. 2x7	do.	8 0 0	—
Do. do. White, 3rd,	do.	10 0 0	—
2x7	do.	9 0 0	—
Do. Gefle, Yellow, 3rd,	do.	9 0 0	—
2x7	do.	9 0 0	—
Do. Nederkalix, Yel-	do.	9 0 0	—
low, 1st, 2x7	do.	9 0 0	—
Do. Kaunissaari, Yel-	do.	9 0 0	—
low, Unsorted, 2x7	do.	9 0 0	—
Do. Langror, Yellow,	do.	9 5 0	—
4th, 2x7	do.	8 15 0	—
Do. do. do. 5th, 2x7	do.	8 15 0	—
Do. Harnäs, Yellow,	do.	8 15 0	—
5th, 2x7	do.	6 15 0	13 0 0
Battens, all kinds ...	do.	0 9 9	0 10 9
Flooring Boards rin. pre-	per square	0 8 6	0 10 0
pared, 1st ...	do.	0 8 9	0 9 6
Do. 2nd ...	do.	—	—
Do. 3rd, &c. ...	do.	—	—

HARD WOODS.			
Ash, Quebec ...	per load	4 0 0	7 10 0
Birch, New Brunswick ...	do.	2 0 0	4 5 0
Do. Quebec do. ...	do.	2 5 0	4 10 0
Box, Turkey ...	per ton	7 0 0	20 0 0
Cedar, Cuba ...	per ft. sup.	0 0 3 ¹ / ₂	0 0 4
Do. Honduras ...	do.	0 0 3 ¹ / ₂	0 0 4
Do. Tobasco ...	do.	0 0 5	—
Whitewood, American,	per ft. cu.	0 1 3	0 1 6
logs ...	do.	—	—
Do. do. planks and	do.	0 1 3	0 3 0
boards ...	do.	4 5 0	8 10 0
Elm, Quebec ...	per load	0 2 6	0 3 0
Jarrah, plank ...	per ft. cu.	—	—
Mahogany, Average Price	per ft. sup.	0 0 5 ¹ / ₂	—
for Cargo, Honduras ...	do.	0 0 3 ¹ / ₂	0 0 6
Do. Tobasco ...	do.	—	—

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Exeter.—For the erection of workmen's dwellings, for the City Council. Mr. Thomas Moulding, A.M.I.C.E., city engineer and surveyor:—
R. Wilkins & Son, Bristol ... £9,480 0 0
W. S. Coles, Alphington, Exeter ... 9,049 15 5
Stephen & Sons ... 8,946 0 0
Woodman & Sons ... 8,840 0 0
W. Baker ... 8,391 0 0
J. Blatchford ... 8,654 14 2
Westcot, Austin & White ... 8,645 0 0
W. E. Blake, Plymouth ... 8,300 0 0
W. R. Brealy ... 7,969 0 0
Ham and Passmore ... 7,819 0 0
G. Setter* ... 7,321 0 0
C. Heath, Crediton ... 6,490 0 0
(Engineer and surveyor's estimate, £7,850. Rest of Exeter.)

* Accepted. † Error made in adding.
Gillingham.—For the erection of a freemasons' hall. Mr. Frederick Smith, architect:—
F. Miskin, Ltd., Gravesend ... £3,264 13 1
W. F. Blay, Dartford ... 3,040 0 0
E. J. Logan, Strood ... 3,031 19 0
Trueman & Son, Chatham ... 2,990 0 0
W. C. Snow ... 2,875 0 0
A. Candler ... 2,863 0 0
H. Harris ... 2,849 0 0
W. Browning, Chatham ... 2,840 0 0
C. J. Harris ... 2,820 0 0
Cornelius & Son ... 2,799 10 0
H. E. Phillips ... 2,793 0 0
G. Gates, Strood ... 2,676 0 0
West Brothers, Rochester ... 2,559 0 0
G. E. D. Woollard* ... 2,375 0 0
* Provisionally accepted. [Rest of Gillingham.]

Hampton Wick.—For alterations and additions to "The Elms," for Mr. F. Jacob. Mr. H. A. Whitburn, architect, 22, Surrey Street, W.C., and Woking:—
G. Oldridge & Son ... £2,377 1,929
G. Kemp ... 1,929
Drowley & Co. ... 1,899
R. Wood & Son ... 1,846
T. Holloway ... 1,722
W. H. Gaze & Son* ... 1,689
* Accepted.

London, W.C.—For demolishing 135-143, Charing Cross Road, and erecting new business premises, for Messrs J. Jacobus & Sons. Mr. W. A. Finch, architect, 76, Finsbury Pavement, E.C. Quantities by Mr. G. T. G. Wright, 3, Great Winchester, E.C.:—
Barrett & Power ... £8,496
Styles & Son ... 8,326
Masey & Son ... 8,296
Whitehead & Co. ... 7,976
Patman & Fotheringham ... 7,973
Lorden & Son ... 7,887
H. Lovat, Ltd. ... 7,800
Shurmer & Sons ... 7,695
Stapleton & Sons ... 7,692
J. Grover & Son ... 7,683
B. E. Nightingale ... 7,589
Killby & Gayford* ... 7,136
* Accepted with additional work, £8,236.

Malvern.—For Bromsborrow waterworks (Contract No. 6), boiler and engine houses, pumping station, coal store and chimney shaft, for the Malvern Urban District Council. Mr. W. O. Thorp, C.E., engineer:—
Pumping station.
G. Evans, Malvern ... £2,050
J. Meredith, Cradley Heath ... 1,578
Broad, Ltd., Malvern ... 1,567
G. Hill, Ledbury ... 1,538
J. Gurney,* Gloucester ... 1,345
[Engineer's estimate, £1,550.]

Chimney shaft.
Broad, Ltd. ... £236
J. Meredith ... 233
G. Evans ... 292
G. Hill ... 221
J. Gurney* ... 210
Ferbeck Chimney Construction Co., London ... 207
[Engineer's estimate, £225.]

* Accepted.
Six Bells.—For the erection of a Presbyterian chapel and schoolroom at Six Bells, near Abertillery, Mon. Mr. R. L. Roberts, M.S.A., architect, Abercarn. Quantities supplied:—
R. Hall, Abertillery ... £2,703 0 0
Skidmore & McWhirter, Abertillery ... 2,364 11 0
N. Bagley, Oak Street Abertillery ... 2,130 8 0
J. Charles, Crindau, Newport ... 2,175 0 0
J. Jenkins, Ltd., Newport ... 2,076 0 0
D. W. Richards,* Ltd., Newport ... 2,007 0 0
* Accepted.

Taibach.—For the erection of proposed buildings at Taibach, for the Margam Urban District Council. Mr. John Cox, surveyor, Port Talbot:—
W. Jenkins ... £2,628 0 0
D. Davies, Cardiff ... 2,359 17 0
Waring, Cole & Waring, Neath ... 2,301 5 4
J. Davis ... 2,276 0 0
J. Nicholas ... 2,237 17 0
M. Cox ... 2,164 0 0
F. C. Williams, Cardiff ... 2,030 0 0
E. G. Groom ... 1,997 0 0
Anderson & Vaughan* ... 1,906 17 0
[Surveyor's estimate, £2,000.]

* Accepted. [Rest of Port Talbot.]

(Continued on p. xxiii.)

ROOFING SLATES:

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SLATE SLAB GOODS:

Both Plain and Enamelled.

ALFRED CARTER & CO., LIVERPOOL.

NATURAL ROCK ASPHALTE

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Office: Brondesbury Park, Willesden Green.

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Jambs, Fenders, &c.

Buttermere Green Slate and Stone Works,

KEBWICK.

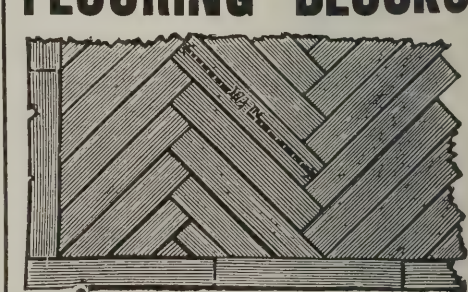
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Apply Secretary,
Southampton Buildings, High Holborn, W.C.

FLOORING BLOCKS



Per 100 Blocks out of sizes.	YELLOW.		PITCHPINE
	At Wharf.	ex Ship within one Month.	At Wharf.
17½ x 3 x 3	12 9	12 0	16 6
17½ x 3 x 2	8 3	7 9	11 5
17½ x 3 x 1½	6 9	6 3	9 0



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With Special Joint to conceal Nails—

1½ x 4 Oak, 56/9 Pitch Pine 27/- per square.

1 x 4 " 45/- " 22/9 "

These prices do not include desiccation.

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Only Address—67, KING WILLIAM STREET, E.C.

Telephone Nos. 601 and 602 Avenue.

TENDERS—cont. from p. xxii.

Kenilworth.—For the erection of a new reformatory school for girls, with lodge, laundry, &c., for the Committee of the Warwickshire Reformatory Institutions. Mr. Charles M. C. Armstrong, architect, 5, High Street, Warwick:—

J. H. Cashmore & Sons, Warwick	£6,130	0	0
E. Smith & Son, Kenilworth	5,999	0	0
R. Bowen, Leamington	5,600	0	0
Frank Davis, Moseley	5,550	0	0
T. Broad, Ltd., Malvern	5,391	0	0
Parnell & Son, Rugby	5,374	7	0
J. Barnsley & Sons, Birmingham	5,348	0	0
W. J. Whittall & Son, Birmingham	5,269	0	0
G. F. Smith & Sons, Leamington	5,263	0	0
Kelley & Son, Coventry	5,050	15	11
Charles Hope, Berkswell	4,942	0	0
W. Moss, Ltd., Loughborough	4,934	0	0

* Accepted.

Rustington.—For alterations and painting works at Millfield, for the Metropolitan Asylums Board:—

	Alterations.		Painting.
Cropley & Sons, Leatherhead	£3,199	0	0
Kirk & Randall, Woolwich	2,892	0	0
Cropley Brothers, High Street, Epsom	2,873	0	0
Lole & Co., Chelsea	2,835	10	8
J. Parsons & Sons, Hove	2,809	0	0
J. Longley & Co., Crawley, Sussex	2,739	0	0
H. Kent, Lewisham	2,701	0	0
A. F. Vigor & Co., S.W.	2,622	0	0

	Alterations.		Painting.
W. A. Field & Co., Brighton	£2,562	0	0
Higgs & Hill, South Lambeth Road	2,544	0	0
G. Godson & Sons, Kilburn Lane	2,522	0	0
Peerless, Dennis & Co., Eastbourne	2,485	0	0
W. Johnson & Co., Wandsworth Common	2,485	0	0
J. Martin, Commercial Road, Eastbourne	2,450	1	11
F. Sandell & Sons, Worthing	2,390	0	0
R. Cook & Sons, Crawley, Sussex	2,318	0	0
J. Littlefield & Sons, Littlehampton	2,279	0	0

[Architect's estimate for alterations, £2,500.]

* Recommended for acceptance.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending September 22nd thirty-four failures in the building and timber trades in England and Wales were gazetted.

A. GELDARD, builder, Leeds.	R.O. Sept. 15th.
P. NICKELLS, plumber, Totnes.	Adj. Sept. 13th.
F. T. PENNY, builder, Northfield.	Adj. Sept. 16th.

E. L. WILLIAMS, builder and contractor, Rhyl. Adj. Sept. 13th.

F. THORNTON, slater and tiler, Croydon. P.E., Croydon C.C., Nov. 8th, at 11.

NEWMAN BROTHERS, masonry contractors, Birmingham. P.E., Birmingham C.C., Nov. 2nd, at 2.

J. W. BAKER, painter and paperhanger, Hull. Adj. Sept. 15th.

C. OWEN, architect and surveyor, Walsall. R.O. Sept. 12th.

J. NORBURY, builder and contractor, Warrington. P.E., Warrington C.C., Oct. 6th, at 11.

W. H. WATTS, builder and contractor, Bristol. P.E., Bristol Guildhall, Oct. 13th, at 12.

H. EVANS & SON, builders and decorators, St. Albans. R.O. Sept. 12th.

J. H. BLACKELL & SON, builders, Plymouth. First meeting, O.R.'s, Plymouth, Sept. 28th, at 11. P.E., East Stonehouse Town Hall, Oct. 10th, at 12.

G. STADDON, plumber, Teignmouth. First meeting, O.R.'s, Exeter, Oct. 5th, at 10.30. P.E., The Castle, Exeter, Oct. 5th, at 11.30.

J. EDMONDS & SON, house decorators, Rochester. First meeting, 115, High Street, Rochester, Oct. 2nd, at 11.30. P.E., Rochester C.C., Oct. 2nd, at 2.30.

J. T. BROWN, builder, Nottingham. First meeting, O.R.'s, Nottingham, Oct. 2nd, at 3. P.E., Nottingham C.C., Oct. 18th, at 10.

F. SHAW, plumber and decorator, Quarry Bank. First meeting, O.R.'s, Dudley, Sept. 29th, at 11. P.E., Stourbridge, C.C., Oct. 5th, at 2.

GROBAK GREEN SLATE QUARRIES.

The attention of Architects is called to these beautiful Green Slates, which are now available for the British Market.

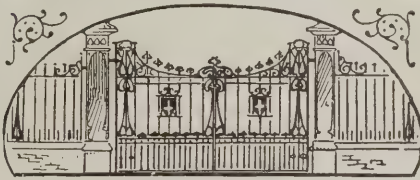
These Slates are unsurpassed for excellence of cleavage, colour and durability.

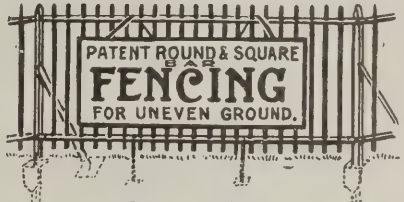
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FENCING
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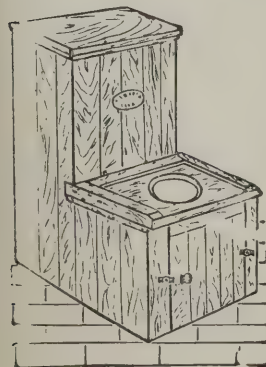
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& CANNON ST., LONDON, E.C.

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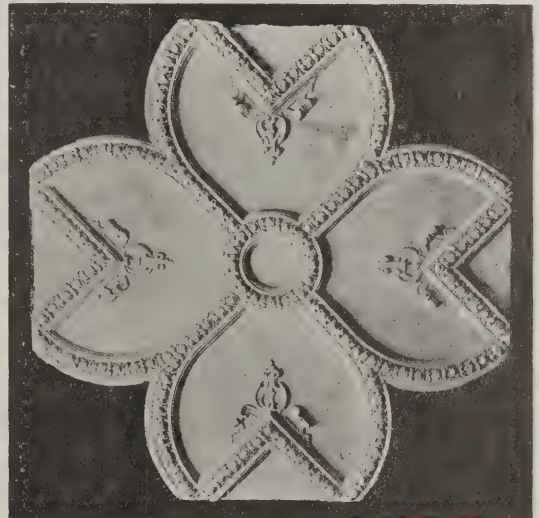
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Closet.**

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ABLE ASSISTANT (24½) seeks RE-ENGAGEMENT. Careful draughtsman.—F. B. HOOPER, The Hermitage, High Wycombe.

ARCHITECT and SURVEYOR'S ASSISTANT, with 10½ years' experience in design, details, specification, and quantities for first-class work, just disengaged, desires RE-ENGAGEMENT.—Z., 6, Hope Terrace, Matlock Bath, Derbyshire. 1377

ARCHITECT and SURVEYOR'S ASSISTANT requires ENGAGEMENT, 16 years' varied experience town and country. Eight years' Government appointment. Domestic, school, and hospital work.—Apply to H., Manor House, Northstoke, near Bath. 1378

ARCHITECT and SURVEYOR'S ASSISTANT (22½), P.A.S.I., requires ENGAGEMENT. 6 years' experience. Working drawings, quantities, surveying, &c. £100.—Box 1400, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (A.R.I.B.A.) desires immediate RE-ENGAGEMENT in Provinces. Large varied experience good class Provincial work. Design, details and experienced Quantity Surveyor. Excellent testimonials. Very moderate salary.—"EXPERIENCE," Box 1380, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (25) disengaged; nine years' experience; good draughtsman, working drawings, details, &c.; London or country.—W. A. N., 46, St. Augustine's Road, Camden Square, N.W. 1372

ARCHITECT'S ASSISTANT (24) disengaged; nine years' experience; good draughtsman, designs, working drawings, details, &c.; London or country.—W. H. L., 83, Elspeth Road, Clapham Common, S.W. 1374

ARCHITECT'S ASSISTANT (21) DIS-ENGAGED. Working drawings, all details, surveying, assist with quantities; experienced; excellent references.—Box 1402, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT, 20 years' general experience, desires TEMPORARY ENGAGEMENTS (Lancashire preferred) as Assistant. Expert designer, draughtsman, surveyor, quantities, perspectives, &c. Terms moderate.—Box 1399, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S JUNIOR ASSISTANT (21) desires SITUATION, free after 23rd September. Four years' experience. Advanced building construction certificate. Moderate salary.—C. E. H., 263, Broad Street, Birmingham. 1341

ARCHITECT'S JUNIOR ASSISTANT desires ENGAGEMENT in a good London office. Five years' experience; age 23. Good references. Salary moderate.—B. E. ATKINSON, Jun., 14, Rosslyn Hill, Hampstead, N.W. 1342

ARCHITECT'S JUNIOR ASSISTANT; six years' experience, five years' article; contract drawings, details, surveying and levelling. Excellent references present berth.—Box 1366, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S JUNIOR ASSISTANT, DIS-ENGAGED October 10th; Good draughtsman, colourist, &c.; mod sal.—H. J. C., 63, Edinburgh Road, Queen's Park, Northampton.

ARCHITECT'S JUNIOR ASSISTANT, 24. Good tracer and colourist, neat draughtsman. Prob. R.I.B.A.; 5 years' experience; salary 25s.—A. C., 46, King Henry's Road, N.W. 1381

ARCHITECT'S JUNIOR ASSISTANT desires a change. London or Provinces. 5 years' experience. Salary to be arranged.—A. G. S., "Kirkdale," Stanmore Road, Leytonstone, Essex. 1386

ARCHITECT'S JUNIOR ASSISTANT seeks ENGAGEMENT. 4½ years' experience. Good draughtsman, tracer, colourist and typist. Knowledge of quantities and specifications. Usual office routine. Lincolnshire or Yorks. preferred. Good references.—Box 1401, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

BUILDER'S CLERK.—Book-keeping, assisting Quantity Surveyor; abstracts, time-sheets, general routine; typewriter; excellent references.—P. H. G., 2, "Fernfield," Bonner Hill Road, Kingston-on-Thames. 1332

BUILDER'S CLERK, experienced, double entry book-keeping, time sheets, correspondence and general routine. Plans, &c. Town or country. Moderate salary.—E. W. H., 11, Archibald Road, Tufnell Park, N. 1348

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HOT WATER, GAS FITTER, and PLUMBER wants EMPLOYMENT. Good references. Abstainer.—Address, 34, Clinton Road, West Green, Tottenham, N. 1406

JUNIOR DRAUGHTSMAN (21) desires ENGAGEMENT. Working drawings, details, good tracer, colourist, &c. Five years' experience, general office routine. Moderate salary.—K., 7, Cornfield Terrace, Eastbourne. 1354

MACHINIST.—Band and circular sawyer, sharpens saws, planing machines, fourcutter; some experience in French spindle; could take charge of small plant; town, country, or would go abroad.—MACHINIST, 51, Somers Road, Walthamstow. 1344

MACHINIST, young, seeks situation on Sawbench or Planer; good refs.; wages mod. London or district.—A. A., Brooklyn House, Bell Lane, Hendon, N.W. 1305

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SURVEYOR'S JUNIOR ASSISTANT, 22, requires post in Borough Surveyor's office; holding public appointment, has served 3 years articles with Borough Surveyor. Country town preferred.—E. BURMAN, Ramsbury, Wilts. 1349

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WANTED Back Numbers of the "Architectural Review," dated May and July, 1902.—Box 1388, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 12.
September, 1905.

THE SELECT COMMITTEE ON PROTECTION FROM FIRE.

WE mentioned recently that a Select Committee had been appointed by the House of Commons to enquire as to the provision of means of escape from fire in factories, workshops, laundries, offices, shops, hotels and other buildings where persons work or live in large numbers. This Committee was appointed at a time when the Select Committee on the fire-escape clauses of the London Building Act was sitting, and seeing that any legislation for the Metropolis must necessarily influence the question generally, and having regard to the fact that it was probable that the retrospective character of the legislation in this direction as far as London was concerned would create a precedent, the members of the Select Committee wisely limited their work of the past session to making their preparations for the next session without taking evidence. They have reported as a matter of fact that, in view of the late period of the session and the pending decision regarding the London Building Acts Amendment Bill, they considered they could not usefully take evidence during the past session, and they recommended their reappointment for the next session, when the law regarding the county of London would be in existence to go upon.

We have given the names of the members of this Committee in a previous supplement, and this list holds good with the exception that Mr. Guy Pym, M.P., was substituted for Mr. Ian Malcolm, M.P. Mr. Munro Ferguson was Chairman of the Committee. The only business of importance executed was a request to the Home Office to prepare a précis of the evidence given before the Committees of both Houses on the London Building Act.

Seeing that the Committee has now once been set up, and that preparations have been commenced, we trust that the Select Committee will be reappointed at the earliest possible date in the new session, for its field is a wide one, and the importance of the subject cannot be underrated.

Mr. Guy Pym, M.P., and Mr. Tennant, M.P.

It is extraordinary what apathy always exists in matters of fire-protection, as far as Parliament is concerned, for as we have already indicated it was practically only due to quite outside pressure that the fire clauses of the amended Building Act were obtained, and similarly it was mainly due to influence brought to bear from outside the actual House of Commons that the Select Committee here under review was really set up.

It is quite the exception to find an individual member of Parliament taking a personal interest in matters of fire-protection, the only

exceptions probably being Mr. Guy Pym on fire-brigade matters and Mr. Tennant on factory matters. Mr. Guy Pym was most successful in having a Select Committee appointed on fire-brigade matters, in which most valuable evidence was collected and most useful work done, but unfortunately up to the present no legislation has resulted. In time, no doubt, some such legislation will be obtained, but the matter has become very pressing. Meanwhile we trust that Mr. Tennant, who has had a Bill before the House of Commons since 1904 in respect to the amendment of the Factories and Workshops Act, will have success in obtaining more rapidly the legislation he advocates.

Mr. Tennant's Factory Bill.

Mr. Tennant's proposed Bill, of course, only deals with the factory aspect of the general question of escape from fire, but it is this that is of primary importance. It may thus be of interest to present the memorandum with which Mr. Tennant prefaces his Bill, and at the same time it may be of interest to note that in presenting the Bill he was supported, among others, by the well-known labour member, Mr. John Burns.

The memorandum with which Mr. Tennant's Bill was prefaced reads as follows:—

Mr. Tennant's Memorandum.

This Bill is limited to the amendment of those sections in the Factory and Workshop Act which deal with means of escape in the case of fire.

The Bill would amend the existing law in several respects. The limitation which confines the provision of means of escape from fire to factories and workshops where more than forty persons are employed would be removed.

It is also framed to make the following change in the existing law:—When a factory or workshop is contained in premises parts of which are utilized for such purposes as offices or warehouses, the local authority is unable to require the provision of means of escape from fire except with the consent of an objecting occupier of any part of the premises which is not used as a factory or workshop. The Bill amends the law by giving the same protection from fire to the worker whether the premises are wholly or only partly occupied as a factory or workshop. The Bill further provides for reference to the county court of any claim by the occupier of any part of the premises against the owner of the building on account of interference with the part occupied.

The other alterations in the law which the Bill would effect relate to the production of plans and drawings, the location of lifts and shafts and the prohibition of unsafe premises.

SPECIAL GLAZING AS A TEMPORARY FIRE-RETARDANT.

DURING the last few years the importance of protecting vertical openings in buildings against the spread of fire has begun to be appreciated by professional men, more particularly in the United States of America, and for this reason various forms of fire-protective glazing have been put on the market, of which wired glass and electro-glazing are the best known. Various firms resident both in the United States, the United Kingdom and the Continent of Europe purvey these different forms of glazing, and it has long been the ambition of various firms interested to prove to the satisfaction of the building world and to insurance corporations that their materials command attention as safeguards.

As to the importance of the protection of openings, a recent report by the National Fire Protection Association of America, dealing with the question of both door and window openings accords considerable space to this question, and we quote in this report the American view of what should be considered fire-retardant in the protection of door and window openings.

The American View as to Protecting Openings.

American opinion considers that regarding the covering to such openings—

(1) They should be made of non-flammable material.

(2) They should be good non-conductors of heat.

(3) In addition to their fire-retardant qualities they should be able to resist the shock and force of fire streams.

(4) They should be so constructed and mounted as to effectively cover the opening protected.

(5) Their ultimate fire-resisting point should be nearly, if not quite, equal to the fusing point of the materials of which they are made.

(6) They should be capable of withstanding the expansion due to heat and contraction due to rapid cooling.

(7) They should be capable of resisting all reasonable blows from falling members.

(8) They should be easy to operate, capable of being made automatic, acceptable in appearance, and should not be prohibitive in price.

The American requirements are more in the direction of providing shutters, blinds and doors to openings, but such coverings can obviously in many instances be supplanted by or supplemented by improved glazing.

Special Glazing.

As far as the glazing of window openings is concerned, the great difficulty has been for the various makers to prove that the protection afforded is not merely momentary, but of some considerable duration, and that given moderate temperatures, *i.e.*, temperatures not exceeding the melting point of glass, such glazing will afford protection quite equal to that afforded by, say, an ordinary 2in. hardwood door intended to withstand fire under similar conditions. It has been difficult to prove this, and it has only been possible to do it step by step, and even now it has only been possible to prove it within certain limitations on the question of size. But a vast improvement has been made of late, and those who have followed the investigations conducted by the British Fire Prevention Committee with electro-glazing and wired glass, dating back from 1899, will see what an advance has been made, until classification of affording "temporary protection" has at last been gained both by electro-glazing and wired glass as manufactured in this country.

In the earlier fire tests of the Committee it has been attempted to show that casements and skylights will withstand fire of moderate temperatures for twenty or thirty minutes, but this year it has been proved that given a limitation of size of 2ft. by 2ft., or (say) 4ft. super., it is quite possible to obtain that resistance which is required of ordinary hardwood doors, namely, that which is termed affording "temporary protection," *i.e.*, a test of forty-five minutes' duration to temperatures of at least 1,500 degs. Fahr., followed immediately by the application at short range of a stream of water from a steam fire-engine for two minutes.

In our supplement of March 15th last we dealt with the results of a test with electro-glazing. In this supplement we deal with two tests in respect of wired glass, of which the reports have been issued this month.

Mr. Max Clarke, F.R.I.B.A., in his prefatory note says:—

"In these days, when all sorts of appliances for the prevention of fire are advocated, it is of importance to consider at the same time the means to be adopted and the materials to be used to prevent the spread of fire. Many of these materials are expensive, and in some cases little is known of their behaviour under actual fire conditions. The comparatively moderate cost of wired glass has led to the present investigation in the hope that the knowledge gained thereby will be useful to all interested in the subject of fire-prevention."

The following are the official statements of the objects and summaries of tests with wired glass put forward by Messrs. Pilkington Brothers, Ltd., of St. Helens:—

THE VERTICAL LIGHTS.**Object of the Test.**

To record the effect of a fire of three-quarters of an hour duration. The temperature to reach 1,500 degs. Fahr. (815.5 degs. C.) but not to exceed 1,650 degs. Fahr. (898.8 degs. C.), followed by the application of water for two minutes, with the view of being classified as affording temporary protection (class A).

Note.—The squares of glass, five in number, were to be glazed—two into a teak frame, two into a steel frame, and one into brick reveals.

Each opening was approximately 2ft. 3ins. (0.685 m.) wide by 4ft. 6ins. (1.37 m.) high.

The openings are described as Nos. 1, 2 and 3:—

No. 1 being a teak frame, fixed in the north opening.

No. 2 being a steel frame, fixed in the centre opening.

No. 3 being a square of glass, in brick reveals.

Summary of Test.

Immediately on lighting the gas the glass in all the openings cracked, particularly round the edges. Beyond the cracks increasing, no perceptible change occurred.

The inside face of the teak framed architrave was considerably charred.

On the application of water there was an irregular patch of small holes made in the upper portion of the centre light, which was also bulged inwards; but otherwise the glass in all the openings remained in position. There were indications that the fire had passed between the frame and the glass of opening No. 1.

The fire did not pass through the glass.

THE HORIZONTAL LIGHTS.**Object of the Test.**

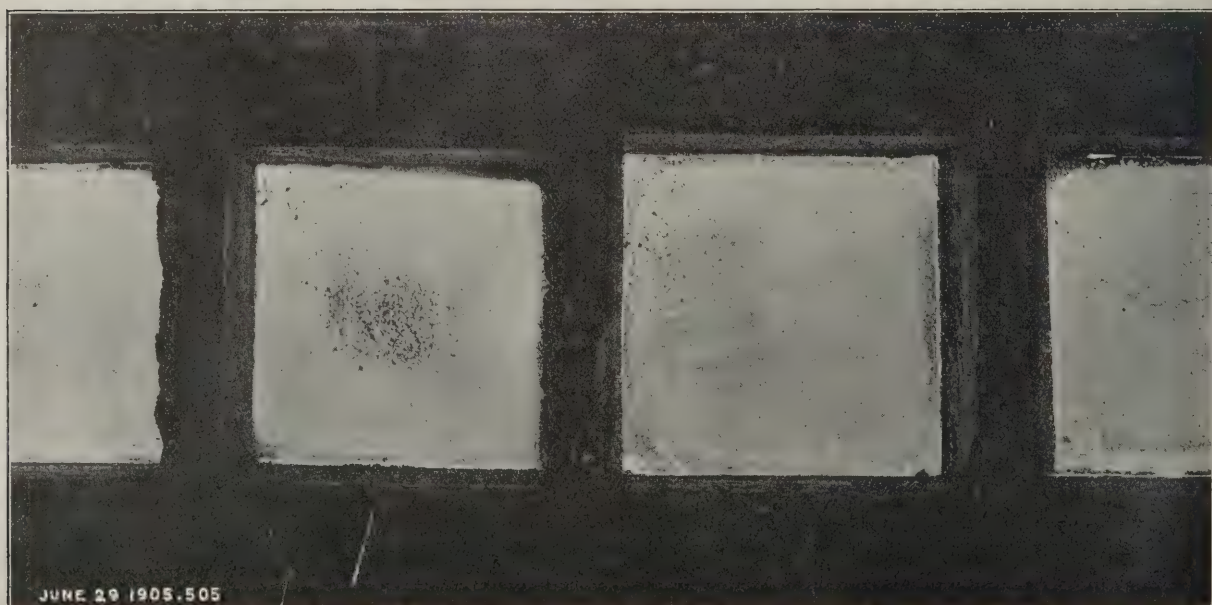
To record the effect of a fire of three-quarters of an hour duration on Pilkington's wired glass, $\frac{1}{4}$ in. thick (0.0063 m.), fixed horizontally as skylights. The temperatures to reach 1,500 degs. Fahr. (815.5 degs. C.), but not to exceed 1,650 degs. Fahr. (898.8 degs. C.), followed by the application of water for two minutes, with the view of being classed as affording temporary protection (class A).

Note.—The squares of wired glass, four in number, to be placed horizontally as skylights, two glazed in elm frames and two into steel frames resting in rebates of elm frames.

The squares in the elm frames to have a



SKYLIGHTS AFTER TEST (FROM ABOVE).



SKYLIGHTS AFTER TEST (FROM BELOW).

sight measurement of 2ft. by 2ft. (0'6095 m. by 0'6095 m.), described as Nos. 3 and 4.

The squares in the steel frames to have a sight measurement of 2ft. 1 $\frac{1}{2}$ ins. by 2ft. 1 $\frac{1}{2}$ ins. (0'6476 m. by 0'6476 m.), described as Nos. 1 and 2.

Summary of Test.

Immediately on lighting the gas the glass in each of the four frames cracked in various directions, with slight but sharp reports. Beyond this no perceptible change occurred in either of the squares of glass, except that between the twelfth and fifteenth minutes small thin flakes came off the upper surface of the glass in square No. 4 in some places.

The inside face of the elm frames was charred from $\frac{1}{2}$ in. (0'0127 m.) to $\frac{3}{4}$ in. (0'019 m.) in depth, and the fixing beads on the outside were twisted and displaced. The steel frames were not perceptibly affected.

On the application of water the glass in each of the frames developed hair cracks all over, but water did not pass through either of the squares of glass. A slight amount of smoke found its way round the elm frames, but fire did not pass through either the glazing or frames at any point.

Water was thrown on the top of the squares of glass but did not pass through. Each of these squares had sagged in the centre from an eighth to a quarter of an inch (0'0031 to 0'0063 m.).

A FIRE AT DURBAN, SOUTH AFRICA.

IT is so extremely difficult to obtain good photographs of fires that we reproduce below an illustration from a negative taken at Durban, South Africa, which shows very clearly a fire breaking through the roof of a building at a time when no flame or smoke has so far come through the window openings.

We take this opportunity to remind readers that we welcome photographs of important fires and ruins of fires, particularly if the effect of the fire on constructional work is shown.

Such photographs should be addressed to "the Editor."

FIRE CONGRESS AT MILAN.

WE understand that a fire service and fire-preventive congress is to be held at Milan in May, 1906, under the auspices of the International Fire Service Council,

and at the invitation of the Italian Fire Preventive and Fire Service Federation. This congress will be held on the occasion

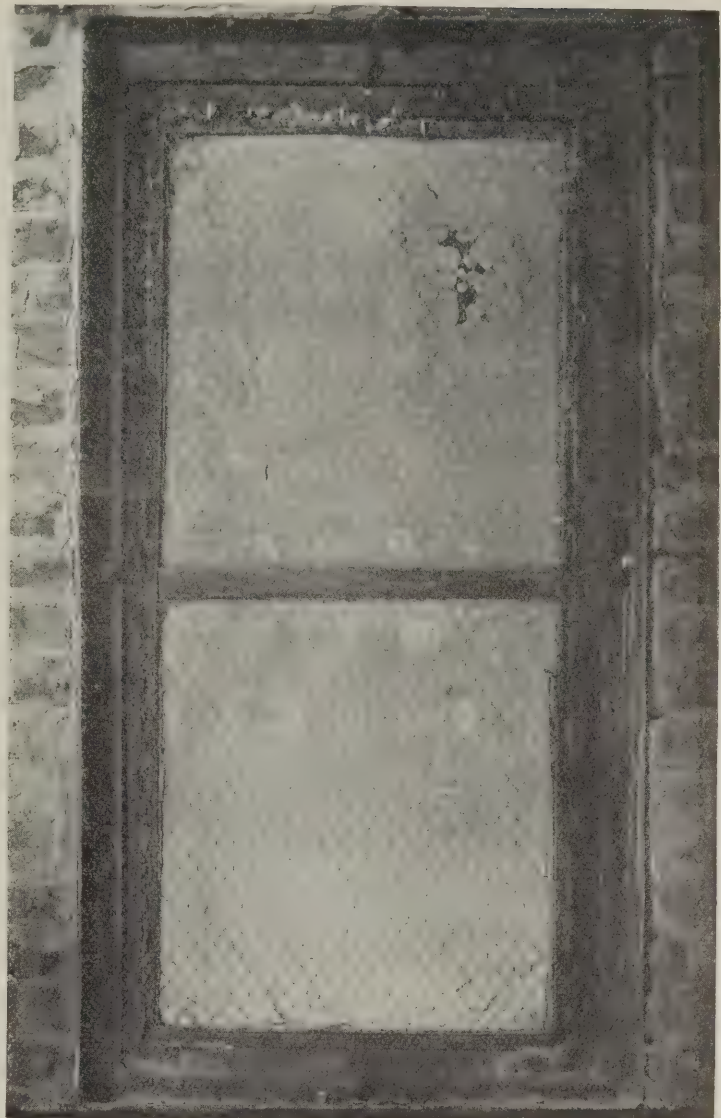
of an exhibition that is taking place at Milan in respect to which the London Chamber of Commerce has formed a special committee.

It may be anticipated that as heretofore with such congresses a number of valuable papers and contributions from all countries will be presented for consideration and discussion, and it is to be hoped that on this occasion, seeing that the local language is one not well known to the majority of those interested in the subject, there will be a considerable staff of interpreters, and that all papers presented will be translated into at least two better-known languages, say French and English. This is a direction indeed in which an improvement might often be effected in international congresses. Translations should be available at the time papers are read and not published months afterwards.

The National Fire Brigades Union will hold their next Council meeting at Liverpool.

Mr. Max Clarke, F.R.I.B.A., has been accorded the Silver Insignia of the Imperial Fire Society of Russia by the Grand Duke Vladimir, acting for the Czar.

Colonials and Fire-Prevention.—It is of interest to announce that a New Zealand section of the British Fire-Prevention Committee has been formed with a nucleus of fourteen, and it is anticipated that a similar section will be constituted this winter in Canada.



A CASEMENT IN METAL FRAME AFTER THE TEST (FROM THE FIRE SIDE).



A FIRE AT DURBAN, SOUTH AFRICA.
(Showing flames and smoke breaking through a roof.)

A NEW YORK FIRE.



View on Fifth Floor.



View on Seventh Floor.

THE EMPIRE STATE BUILDING FIRE NEW YORK.

THE three illustrations which we publish herewith are from photographs specially taken for the "Fireproof Magazine" showing parts of the sixth, seventh and eighth storeys of the Empire State building, 640, Broadway, situated at the south-east corner of Bleecker Street, New York, which was partially damaged by fire on March 22nd last. As will be seen in the views on the seventh and eighth storeys, the floors of this building were of fire-resisting construction, and that is the reason why the building was saved almost entirely, even though all the water thrown on it had to be raised to a great height by the fire-engines alone because the stand-pipes and hose in the building proved to be useless.

The building measures 25ft. by 125ft., and has nine storeys, above the street level. It was erected eight years ago. The outside walls are lined with hollow brick and the floors are all supported by deep steel I-beams. The floors are filled in between the I-beams with long-span segmental arches of porous terra-cotta blocks. The arches were also plastered on the underside of the seventh and eighth-storey ceilings. The ceiling of the sixth storey appears to have been furred off and plastered to a straight line.

The fire started on the seventh storey among millinery goods. The three upper storeys were occupied for wholesale millinery business, which, it is well known, is very combustible, and the accounts show that the fire spread through the three upper storeys with great rapidity, totally destroying the contents.

The fire did not extend below the seventh storey, the damage in the sixth and lower storeys being only from water.

But the pictures convey lessons of faults in building in no way attributable to the construction. The hallways around the stairs and the elevators were partitioned off with substantial partitions, which were all left standing where they were not supported by wood. But here we see the unnecessary amount of wood used in their construction. The glass in the partitions, of course, disappeared and much of the woodwork. The fire communicated to the eighth and ninth storeys through the stairways and elevators, and also through the outside window. It will be seen that outside window-frames in the seventh storey have entirely disappeared. The damage to the building was mainly in the combustible material.

The site of this building has a remarkable fire history. Nine years ago it was occupied by the Empire State Bank, a building of ordinary construction. It was then totally destroyed by fire, and the fire communicated across Bleecker Street to a large new building on the north-east corner of Broadway and Bleecker Street through its large exposed windows. This building was almost a total wreck, and it was announced by the press to be a "fireproof" building which had failed. When the nature of its construction began to be known it was found that while incombustible materials had been used in its construction it violated every well-known principle of fire-resisting construction. The floors were supported by long steel girders from wall to wall, which were entirely unprotected by any fire-resisting material, and the ceilings were all of wooden lath and plaster, which provided additional fuel to destroy the girders which collapsed wherever the fire was severe. An officer of the fire department was killed by falling through a marble platform in the iron stairs, and many other foolish constructions were discovered. It demonstrated that the additional cost of all the iron and steel in the building had been a waste of money, because it had not been protected from fire.

PREVENTION OF FIRE LOSS IN THE UNITED STATES.

LONDON has recently had the pleasure of a visit from that noted expert on economics, and questions of fire loss in particular, Dr. Edward Atkinson, the President of the Boston Manufacturers' Mutual Fire Insurance Co., and at the same time President of the Boston Insurance Experimenting Station. Mr. Atkinson, who at the age of eighty still shows the youth and energy of a man of half his years, has probably done more for the prevention of fire loss in the United States than any other man in that country, and he has had the great advantage of being able to carry out his programme on essentially commercial and economic lines, inasmuch as his teachings were always embodied by the practice of the Mutual Insurance Corporations, which he developed and controlled. These Mutual Corporations, whose work it is to organize the Mutual Self-Insurance of Manufacturers having similar fire-hazard to contend with, have done an immense amount of good in the United States, not only as far as fire loss proper is concerned, but also in many questions relating to the general economics of the industries with which they are in touch, for they are managed on broader lines than insurance offices generally, their scope extending to advising their clients as to anything in the way of order or economy which may increase their efficiency and at the same time reduce the fire-hazard.

The Attitude of the Fire Insurance Companies.

It is very rare indeed that fires of importance occur on property insured on the mutual principle. This is mainly due to the remarkable system of inspection, survey, control and watching practised in regard to properties thus insured. Although ordinary insurance companies, known in America as stock companies, would be loth to confess it, we may also take it that the new movement now to be found among all the leading fire offices of the United States to encourage fire-prevention and to go about their work more scientifically than heretofore, has been mainly due to the example set and the results obtained by the mutual system which Mr. Atkinson organized. There can be no doubt that at the present moment the managers of the insurance companies of the United States, and the resident representatives of the British insurance companies trading in the United States, are doing more for fire-prevention than any other insurance officers anywhere in the world.

In fact, the expensive lessons, due mainly to the short-sighted policy that used to prevail, have now made it necessary in the States to give up that extraordinary idea that the science of fire-prevention could be excluded from an insurance company's programme of work.

We publish below some interesting notes by Dr. Atkinson upon the position of the fire loss question in the United States, which will be found to have a considerable bearing upon the problems of fire-resisting construction and design, while at the same time they suggest directions in which fire-insurance offices and legislative authorities can materially advance the welfare of the community.

Some Views by Edward Atkinson, LL.D.: Climatic.

"The problem presented to the underwriters of the United States and to the community as a whole is totally different from any problem that could be found in any European country, especially in Great Britain. First, the climate or climates of the United States vary from those of Europe in matters that have an important bearing upon the construction of buildings. I will omit the conditions of the extreme South and of the extreme North, dealing with the great section which extends from the Atlantic to the Pacific, between parallels of latitude

35 degs. to 45 degs. N. In this section will be found the larger part of the population, the greater number of factories and workshops, the principal cities and public buildings, and by far the greater number of the public school buildings in which the sessions of the common free schools are held. Within this section there are very great variations between summer and winter, the common range of the thermometer being from 30 below zero Fahr. — (34 degs. C.)—sometimes lower—to 90 Fahr. + (32 degs. C.), and sometimes higher. There is also a great variation in the constant of humidity. On the whole, the entire section may be considered dry as compared to the average of Great Britain until we reach the extreme western coast, where the climate of Oregon and Washington more nearly resemble the humid climate of Great Britain."

Materials.

"The next variation from European conditions is to be found in the huge abundance

the atmosphere within the dwelling or building, making the house very damp and difficult to heat; whereas in the hot summer brick walls heat very rapidly and become intolerable unless expensively constructed with air-spaces. On the other hand, wood is well known to be among the best of the non-heat-conducting mediums, and when disposed in thick sections of heavy mass the building of wood or timber, with properly-constructed roof, is warmer in winter, cooler in summer, more easily heated and ventilated and in every way a more sanitary building than any other kind yet devised except at very heavy relative cost."

Log Construction.

"The typical dwelling of the early settlers was therefore the log cabin, the most comfortable and suitable dwelling that could have been devised or constructed at any moderate cost within the means of the early settlers. The next typical dwelling-house, built by the richer citizens when the various colonies



THE EMPIRE STATE BUILDING FIRE, NEW YORK: VIEW ON SIXTH FLOOR.

of timber, both resinous and hardwood, and the relative scarcity of good building stone in the earlier period of the history of the country. As yet no building stone has been discovered corresponding to the stone which is so much used in France and Belgium, which can be cut and carved like cheese, but hardens like iron on exposure to the atmosphere for a short period. It therefore happened that the best material for the construction of dwelling-houses in the earlier stages of the growth of towns and cities and throughout the country districts is wood, disposed in a suitable manner and properly finished within and without, rather than brick or stone. It is also true that when these latter materials are used in the ordinary way, that is, without excess of cost in building thick walls with air-spaces in the walls to prevent ill effects of cold, heat and dampness, they are alternately affected by heat, cold and dampness in excess, from which properly-constructed wooden buildings are free. In the extreme cold of winter brick and stone walls become chilled, presently gathering humidity from

began to prosper, was constructed in what is now known as the colonial style by well-trained mechanics who brought their conceptions from England. In the early period these dwellings were constructed of oak timbers, heavily framed, covered in with very thick boards, nailed on with wrought-iron nails; often filled in between the wood and the inner plastering with brick and then finished in a very solid manner—often, in principal rooms, with panels of the old English style. These broad, well-proportioned colonial houses left nothing to be desired in comfort, convenience and safety at the standard of that period and under those conditions. Many still exist, some of them over 200 years old."

"The solid method of construction, both of town and country buildings, however, gave place to a very dangerous type of building from the underwriter's point of view, when the circular saw was applied to cutting up the solid timbers into plank, joist and scantling of various kinds, which have been put together in what has sometimes been called

basket framing, leading to the construction of buildings of a cellular type; the light frames being put together in such a way as to be very firm and strong by bracing and boarding on the outside, or covered in by brick walls in cities; the plastering within on wooden lath and placed on the face of the inside of the frame; partitions constructed in the same way and floors of the same kind; so that the result is a building pervaded with cells of wood very difficult to cut off from each other, communicating with a hollow-ceiled roof of the same type of construction; hence the largest possible loss by fire is assured from the least possible cause."

Slow-combustion Construction.

"The change which has been brought about in factory construction under the influence of the Factory Mutual Underwriters has not been in giving up the use of wood or in any effort to construct fireproof mills or workshops; but in reverting, one may say, to the heavy timber construction of the colonial period and the disposal of plank and timber within brick or stone walls in such a way that there may be no concealed spaces through which fire may pass out of reach of water. In that way, and by evolving suitable safeguards and means of protection, the whole system of constructing the textile factories, paper mills and workshops has been rendered safe and suitable. The losses by fire within the risks which are under the supervision of the Factory Mutual Underwriters have been, in the older companies, for fifty years less than 15 cents per year on each hundred dollars ('0015 per centum) of insured property; and during a period of more than seven years the losses within these risks have been less than 4 cents per year on each hundred dollars ('0004 per centum) of insured property, or about one-fifteenth part of the loss on insured property outside their range. Their influence is now pervading sections of the country which it has only lately reached, and a profound change is coming over what may be called industrial architecture, since the prevention of loss by fire in factories and workshops of slow-burning construction has been made an applied science, of which the rules and practices are easily mastered.

"Having drawn attention to the different conditions which govern architecture and building in the United States as compared with European States, we may now take up other conditions. It would have been a misfortune had the people of this country adopted more durable methods by constructing city buildings, factories and workshops, of a more permanent kind than they did construct. Such buildings would have been erected at a much heavier cost, they would have become an encumbrance upon the land, and yet of such solid construction that they might have been incapable of being converted to the right use of modern mechanism. It is only about thirty years ago that a most skilful and competent mill engineer, under whose supervision some of the largest textile factories had been constructed, made the remark that it was not judicious to plan any factory building for a duration of more than twenty-five years, except as to the foundations. Had he made that remark a few years later he would not have excepted the foundations. The textile factory and many other industrial buildings constructed fifty years ago were not over 50ft., often less, in width, and some of them were eight or nine storeys high. The next type was a factory or workshop 60ft. in width and five to six storeys high. Neither type of building is fit for modern conditions, and no person could run modern machinery with any profit whatever in the old type of narrow and high factory building. The modern textile factory is seldom more than three storeys in height for carding and spinning;

one storey for weaving. Wherever there is room, machine shops are built of one storey, and many other industrial buildings are now being constructed in a similar way. The diffusion of light by ribbed or prismatic glass assures an even daylight over very wide areas, with freedom from glare near the windows.

"These rules and methods of slow-burning or mill construction and for the diffusion of light are now being established throughout the United States beyond the area of the influence of the Factory Mutual Fire Insurance Companies, by the distribution of documents from the Insurance Engineering Experiment Station, now beginning its work.

Modern Construction.

"We may now take up the growth and construction of towns and cities. In that, again, a rapid construction of wooden buildings for temporary use has been and still is necessary for the housing of the population. Throughout the middle and the far-west, where public lands have been disposed of in quarter sections of 160 acres each, towns have been planned on rather a grand scale with a view to future growth into cities. In very many cases that growth has been attained within a very short number of years. The first buildings, hastily constructed of wood, soon give place to a better class, and if the town grows a wider area may be covered with wooden buildings detached from but very close to each other, the only conspicuous building of a durable kind being the public common school-house, for the construction of which reservations have been made from the public land. Presently the detached wooden buildings give place to brick blocks of a more permanent character, and yet not suitable for any very long duration. In the older cities of the East narrow streets may be bordered by alternating very old wooden buildings and modern structures, safe or unsafe as the case may be.

"Hence comes the necessity for very completely organized and efficient fire departments, and yet occasional conflagrations occur; witness the great fires in Chicago and Boston. These conflagrations were not unmitigated evils. They were disastrous to individuals and to part of the insurance companies, but they cleared away a great ruck of unsafe and unsuitable buildings, made the way for readjusting lines of streets, and both in the end worked improvement in the cities at the cost of the individuals who suffered. The Boston fire, however, did not discriminate wisely. It approached quite a large section of old and dilapidated buildings, occupying land leased nearly 100 years ago upon a ground rent—this lease so near its termination that it is not for the interest of the owners to remove these old buildings, but to get all they can out of them, so that they remain a blot and menace in the centre of the vast business district. Had the Boston fire exerted sufficient discrimination to cross a street and to wipe out that section on the leased land, it would have been a yet greater benefit to the city of Boston. These long ground rents are very uncommon. They are now prohibited in many States, and where they exist are obstructive to the public welfare.

"It thus happens that what may be called unsafe methods of construction have been both necessary and expedient in the progress of the development of the country, and that more permanent buildings which would have absorbed a much greater part of the small capital available would have been an encumbrance rather than a benefit.

"Such being the quality and the conditions of the general average of industrial buildings, shops, warehouses, &c., constituting 95 per cent. of the insurable value of property in the United States outside the lines of the Factory Mutual Companies, what are the

conditions to which the prevention of loss by fire can be applied? They are either the incapacity of architects and builders to apply conditions of safety to the construction of ordinary buildings, or the yet greater incapacity and unwillingness of owners to change from the bad methods even at the instance of an intelligent architect. Faults are committed and re-committed by owners which might be remedied without increase of cost, and very often at less cost, if it had not become the habit of owners and occupants to consider their duty ended when they had negotiated a policy of insurance covering whatever risk (often avoidable at a lessened cost), they might chance to commit. The next element of danger is the gross and criminal carelessness of the occupants of such insured premises.

Fire Loss.

"The ash heap of the United States averages 150,000,000 dollars (£30,000,000 sterling) a year, two-thirds of which is due in about even proportions to the inattention, incapacity or negligence of owners, occupants, builders and architects alike. Or, to put the case in another way, the ash heap, averaging 150,000,000 dollars a year, might easily be reduced by one-half; excess of premiums and heavy cost of insurance, amounting to at least 80,000,000 dollars (£16,000,000 sterling) a year; the excess of water-supply and cost of fire departments, which may be estimated at 20,000,000 to 50,000,000 dollars (£4,000,000 to £10,000,000 sterling) more, makes the aggregate remediable excess of cost of fires in the United States at least 200,000,000 dollars (£40,000,000 sterling) a year, all of which might be saved. This may be attributed mainly to the restless energy and severe work given to attaining the main point of large production from resources as yet only beginning to be worked upon, and their distribution, to the neglect of the lesser elements and close economy in the small details, and to the total lack of any conception on the part of the owners and occupants of buildings that they themselves are the only persons who can prevent loss by fire by attention to construction and suitable safeguards; fire departments being only capable of dealing with the fires when they occur, and underwriters being only capable of showing the way and giving advice by which the heaviest losses may be saved.

Safeguards.

"The safeguards which are now being introduced, notably the automatic sprinkling system, might, in the judgment of the writer, abate more than one-half of this annual loss. The larger part of the losses is in the large workshops, factories, warehouses and shops for the distribution of goods. They occur in a relatively small number of fires, each of large proportion. They occur, in by far the large majority of cases, in buildings which, although not good models, are capable of being well protected by automatic sprinklers, by standpipes and hydrants at vantage points and upon the roofs, so adjusted as to be worked by the public fire department, and by care in occupancy.

Insurance Aspects.

"We now come to the position of underwriters other than the Factory Mutual Underwriters in this matter. Twenty years ago, or thereabouts, it was thought to be the function of the stock underwriter or manager of a stock insurance company to take risks as they might happen to be at a rate which it was assumed would cover the risk, leaving a margin of profit. This system worked very well down to the date of the Chicago fire, but under it no provision had been made by a large part of the insurance companies for the hazard of an extensive conflagration; hence the bankruptcy of very many insurance companies. An advance in rates was made, but as yet no system of inspection was

established before the Boston fire, and that, again, rendered bankrupt nearly every insurance company in Boston and many others. Shortly after, the underwriters, having found out that betting on bad risks even at high rates was an unprofitable business, began in Boston a system of inspections, putting conditions upon risks, re-rating, and establishing premiums according to compliance with conditions.

"This system has been extended throughout the country, elevating the profession of the underwriter and tending to the greater security of the community, and promising hereafter greater immunity from large losses. In fact, a large reduction in the proportion of loss to property insured has been made in recent years. The losses are or may be larger in the aggregate, but the property calling for contracts of indemnity against loss by fire (now 25,000,000,000 dollars = £5,000,000,000 sterling insured) has increased by such leaps and bounds as to make the proportion of loss to the aggregate hazard somewhat less than it was a few years since.

"In this way the lines of future improvement are well marked. The different unions and combinations of the stock underwriters have established testing laboratories, notably in Chicago, where they are dealing with very many problems that do not arise with the Factory Mutual Underwriters, and with some of those on which they are working in harmony with us. On the other hand, the right methods of building factories and workshops of timber, stone and brick have been fully established, and the methods of protecting by safeguards have been brought to a final condition in the present state of the art.

The Steel-framed Building.

The invention of the self-sustaining steel frame building, developed in the construction of what are known as skyscrapers, has brought an entirely new problem before the underwriters as well as the engineers. In the first instance it was assumed that because a building was made of incombustible material it might be considered indestructible by fire, with very slight protection to the metal from heat. The Factory Mutual Underwriters distrusted this theory and have, with rare exceptions, kept unprotected steel beams from being used to support plank floors, and have in recent years caused cast-iron posts, formerly used in the support of factories, to be disused, the preference being given to squared wooden posts.

"With the increasing cost of timber and

possible scarcity of large logs it became expedient for the representatives of the Mutual Underwriters to be prepared for so-called fireproof construction. To that end the Insurance Engineering Experiment Station has been established under the charge of Prof. Charles L. Norton for testing both by fire, by laboratory experiments and by lapse of time all the different methods of so-called fireproof construction and all the fire-resistant and fire-retardant materials for inside finish.

"The experience of the underwriters who insure the steel-framed buildings has not justified the great confidence with which the work was undertaken. Very destructive fires have occurred in buildings of this type, which have been filled with combustible contents. In some cases it has been the judgment of the appraisers that the total loss on contents of very large value has been due to the resistance of the building; whereas in buildings of ordinary construction which fell after a fire of moderate duration there have been large salvages on damaged goods.

"Several of the methods of protecting steel from heat have failed, and while the building has stood well and has, I believe, in all instances been capable of repair, there has been much damage by heat, especially in the upper storeys. It has proved that the prevention of loss by automatic sprinklers is as necessary in an incombustible building as it is in any other. A large portion of the biggest department stores is now being equipped. Other fires in incombustible buildings, causing very little damage, have generated so much suffocating smoke as to make them hazardous and to lead towards the danger of a panic."

THE NEW TESTING STATION.

WE publish on this page a plan of the new testing station which was completed this summer, with a view of showing the arrangement of the testing chambers and particularly the two new styles of chambers demonstrated in huts Nos. 1 and 3.

In hut No. 1 we find the composite chamber of which part can be utilized for door tests and part for tests with different forms of glazing.

Hut No. 3, on the other hand, shows the special large size hut for floors measuring 15 ft. by 22 ft., which is a size very common for rooms in office and warehouse buildings,

and allows large spans to be tested. As to the character of the testing chambers, they are too well known to require additional description beyond that the stock brickwork that had always been used in the testing chambers has certainly been found to be one of the most suitable materials for fire-resistance, the stock bricks at times actually clinking owing to the heat applied to the objects under investigation, but always remaining sound and in the extreme showing some cracks at the most exposed point.

Tests in Preparation.

The tests in preparation include the much-discussed test with floor sections showing seven different aggregates of concrete, the special object of the test being to show the relative reliability of these various aggregates under test, of fire, followed by the immediate application of water. The test is to take place in hut No. 2, and there will be seven bays measuring 3 ft. 3 ins. centre to centre, each 10 ft. long and each slab of concrete being 3 ins. thick.

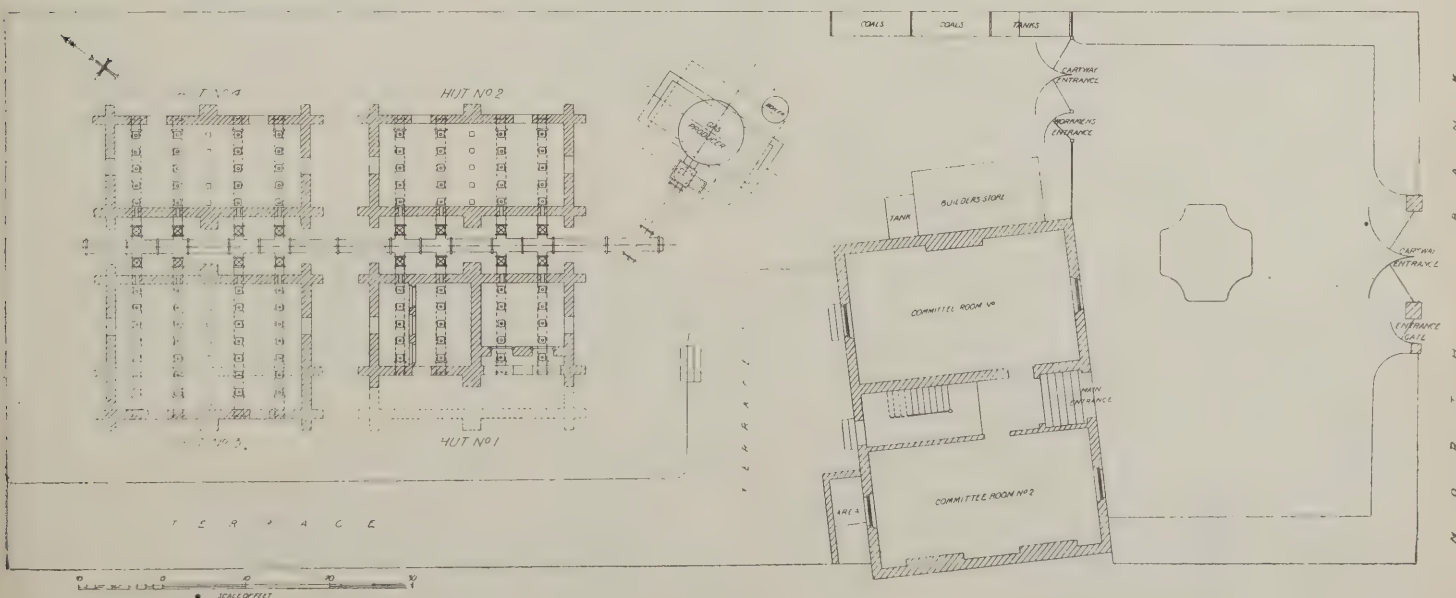
The seven aggregates are (1) blast furnace slag concrete, (2) broken brick concrete, (3) broken granite concrete, (4) burnt-ballast concrete, (5) coke-breeze concrete, (6) furnace clinker concrete, and (7) Thames ballast concrete.

For the concrete the Associated Portland Cement Manufacturers, Ltd., have provided their "Ferrocrete" standard cement and also a sand from their Gravesend yard. The other materials have been obtained from Messrs. Broad & Co., the builders' factors, and a pedigree of each of the different materials has been obtained, which is of particular importance in such a case as the furnace slag and the furnace clinker. The concrete was put into position during the week ending September 16th, and we understand that the time allowed for setting and drying is twenty-eight days.

Parallel with this experimental investigation on behalf of the British Fire Prevention Committee, Messrs. Coignet are in occupation of hut No. 3, where they are erecting a floor on their reinforced-concrete system in which they are utilizing clinker-concrete.

Besides this, as previously announced two, tests are in preparation in respect to Messrs. Cullum's pumice ceiling slabs and Mr. Jabez Thompson's stanchion coverings.

It is expected that the two testing days on which this series of four tests is to be conducted will be in the middle of October.



THE NEW OFFICIAL TESTING STATION.

Showing the large testing chamber for floor tests (No. 3) and the composite chambers for door and window tests (No. 1).



VIEWS OF THE BREMEN DOCK FIRE.

In the previous supplement further views showing the collapse of all unprotected steelwork at this fire were published.

CHICAGO'S NEW BUILDING BY-LAWS.

Extracts from the new Building Ordinance adopted by the City of Chicago this year.

IN continuation of the extracts presented on pages 20, 21, and 22 of the previous Fire Supplement we herewith present the clauses relating to "cinder-concrete," which should be a useful guide to those who specify "coke-breeze concrete," "clinker-concrete" and "furnace slag concrete":—

Approved Cinder-concrete Construction.

968. (Concrete Construction.—Approved Cinder.)—The term "approved cinder-concrete construction" shall apply to all buildings in which all parts that carry weights or resist strains, all exterior walls, all interior walls, all interior partitions, all stairs and all elevator enclosures are made entirely of incombustible material, and in which all metallic structural members are protected against the effects of fire by approved cinder-concrete proportioned, mixed, applied and secured as herein described. Approved cinder-concrete construction may be used for all buildings in which fireproof construction is mandatory by this ordinance, or where ordinary construction may be used.

969. (Concrete — Cinder — Approved). — Approved cinder-concrete shall consist of a standard Portland-cement, torpedo sand, and clean, thoroughly burnt, steam-boiler cinders, free from deleterious matter, no particle of which shall be larger than 1 in.

970. (Cinders—Quality).—The volumetric quantity of the cinders combined with the torpedo sand shall not exceed the volume of the Portland cement by eight times. All of the ingredients of approved cinder-concrete shall be thoroughly worked and wet so as to cover each piece of cinder with moistened cement; and the cement and sand shall fill all of the voids between the cinders.

All approved cinder-concrete shall be cast and rammed in an unset condition against the metal.

The minimum thickness of approved cinder-concrete covering in structural metal shall be 2 ins. In every case the thickness of the coverings shall be measured from the extreme projection of the structural metal unless otherwise provided in this ordinance.

971. (Columns Approved—Concrete Coverings).—The approved cinder-concrete covering of the columns shall be not less than 3 ins. in thickness from the extreme projection of the metal, including the plastering, and in all cases the cinder-concrete shall be rammed solid against the column metal, filling all channels and open spaces

within the perimeter of the finished plaster column. Approved cinder-concrete column covering shall have metal binders of No. 8 gauge wire embedded in and around the columns for each 16 ins. in height of the column, provided, however, that in buildings of approved cinder-concrete construction the columns may be covered with one thickness of metal, furring metal, lathing, and not less than three coats of mortar.

In places where there is trucking or wheeling, or handling of packages of any kind, the lower 5 ft. of each and every column shall be encased in a protective covering such as is described in section 923 of this ordinance.

972. (Beams and Girders—Approved Concrete Construction).—The beams and girders of a building built of approved cinder-concrete construction shall be enclosed in approved cinder-concrete which shall be not less than 2 ins. in thickness at any and all points of the structural metalwork. The approved cinder-concrete covering shall be reinforced with metal clips or wire binders, either or both of which shall not be more than 16 ins. on centres in the direction of the length of the structural member.

The top of all girders or beams shall be protected with not less than 2 ins. of approved cinder-concrete.

A roof or floor construction of cinder-concrete may be used for any span between structural members that will carry the test loads required by city ordinance for such floors and roofs.

973. (Segmental Arches).—Segmental arches shall be not less than 3 ins. in thickness at the crown.

974. (Floors—Flat Slab Construction).—Flat slab construction shall be not less than 4 ins. in thickness for spans of 8 ft. or less. Flat slab construction shall be not less than 5 ins. in thickness for spans between 8 ft. and 10 ft.

Approved cinder-concrete shall not be used as a floor or roof construction unless such approved cinder-concrete is reinforced by steel or iron, and such reinforcement shall not weigh less than 1 lb. per sq. ft. of superficial surface.

All reinforcing steel shall be completely enclosed by the concrete.

Wood nailing strips for floor surfacing may be used in buildings of approved concrete construction, provided, however, that such nailing strips shall be embedded as described in section 934 of this ordinance.

975. (Partitions).—The partitions in buildings of approved cinder-concrete construction shall be as described in section 935 of this ordinance for partitions in fireproof buildings, provided, however, that partitions may be built wholly of metal studding, metal lath and plaster, but no such partitions shall be of a lesser thickness than 1 in.

The partitions around stairs, or stair halls, or shafts, or elevators, or public lavatories, shall be wedged tight between the structure of the floors and ceilings, or if such partitions are of plaster the metal or metal studding shall be secured to the structure by clips, bolts or other metal fastening, and in no case shall any such partition be built on the wood flooring or wood nailing strips.

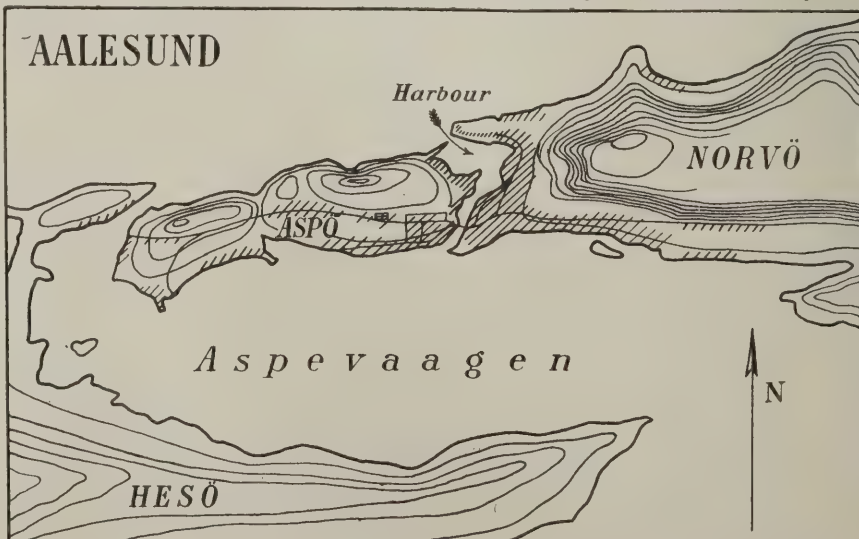
976. (Walls—Enclosing).—The enclosing walls, the covering of exterior side of mullions, beams, girders, lintels, the enclosure of pipes, pipe shafts, the doors into shafts, windows into shafts, covering of girders, covering of trusses, cut-out boxes, chasses, stairs, landings, painting, rivets, bolts, inspection of truss designs, inspection of trusses, precaution against wind-pressure, and all other items required in the sections on fireproof construction and in the sections on skeleton construction, shall, in buildings of approved cinder-concrete construction, be designed or built or covered or made of the material called for or any one of a number of these requirements, as described in such sections describing the requirements of skeleton construction or of fireproof construction in this ordinance, provided, however, that approved cinder-concrete as described herein may be used for all protective covering of structural metal.

THE AALESUND FIRE.

THOUGH of no great technical importance from a fire point of view, it would be well, at a time when Norway is so much before the public, to prevent this fire from dropping into that oblivion which so often occurs in respect to conflagrations nearer home. The Aalesund fire was remarkable as under the class of what we would term village fires. An enormous number of minor buildings were destroyed with great rapidity during the cold climatic conditions, and a large number of inhabitants rendered homeless and destitute. The occurrence was one that could easily happen in some of our northern villages and townships.

Aalesund has about 14,000 inhabitants; it is situated on the Mold Fiord, among the islands of the Norwegian coast. Most of the buildings were mainly of wood construction. The fire area is shown shaded on the plan.

One very remarkable feature of this fire was the splendid aid rendered at the instance of the German Emperor by the Hamburg-American Steamship Co., which organized a relieving expedition with marvellous celerity, and of the highest possible efficiency.



THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

October 4, 1905. Vol. 22, No. 556.

6, Great New Street, Fetter Lane, E.C.

Summary.

Writing about the sculpture on the new War Office in Whitehall, Mr. M. H. Spielmann says that Mr. Drury has gone, probably, far beyond what was expected of him "by revealing a power of thought and invention, and a capacity for handling a big conception realized on a big scale, of which his previous charming work had given promise rather than proof. He has thus justified himself and the selection of the authorities in the vast personifications of Peace and War which, seated in Michael Angelesque juxtaposition, decorate the angles and side faces of the building." (Page 193.)

In a paper which he read before the recent Johannesburg meeting of the British Association Mr. Reginald G. Kirkby, A.R.I.B.A., said that until some additional means were provided to enable the young South African architect to obtain a proper theoretical training they could only hope to turn out rule-of-thumb men. There were practically no existing facilities for students to obtain the necessary training, although the R.I.B.A. had consented to hold examinations in South Africa. (Page 201.)

The consideration of least importance upon the exterior of a building is the decoration of its broad surfaces, which in most cases are best left plain. If, however, for purposes of scale, tone or colour these surfaces are to be decorated, they become an all-over pattern, either a diaper or of parallel bands or forms suggested by the material of which the surface consists. (Page 190.)

The late Mr. Alfred Waterhouse bequeathed legacies varying from £100 to £1,000 to present and former pupils "in grateful recognition of their efficient and willing services." (Page 198.)

A great boulevard, costing £3,000,000, is to be made across Madrid. (Page 201.)

In St. Petersburg private dwellings must not be more than 77ft. high. (Page 192.)

The stonework of the great east window of Tintern Abbey has been taken down and reset, as it had become in a more or less dangerous condition. Some pieces of the main tracery which had fallen were found, and it was thus possible to complete the large ring in the head of the window as formerly existing. (Page 195.)

Our ancestors had only a few materials, which they thoroughly understood and used in the most direct and unflinching manner. If they did not know the chemical and physical properties of these materials as well as we do, they had a practical insight into their working, which is of far more importance in design than the most profound analysis. (Page 200.)

The Estimating Clerk.

At the present season, when contractors are experiencing difficulty in obtaining sufficient work to carry them through the winter—which is always the slack period in the building trade—and at a time which it is hoped will be the last of several years of bad trade, it is opportune to enquire into the current practice of estimating for contracts. Estimates are prepared by estimating clerks who work to a standard which is the result of a policy adopted generally for many years by contractors. Most contractors seem to imagine that what others can do they themselves can do, and their estimating clerks are instructed either to get "the job" or do the best they can to secure contracts. If the estimator secures a contract by undercutting the next lowest tender by only a few pounds, he is appraised highly for the moment, until the job is found to be turning out badly, without the profit expected, or at a loss. The estimator seeks a ready excuse in disclaiming responsibility, ascribing the fault to the foremen or to the inability of the contractor to purchase his materials at the lowest price or in the cheapest market; and of course as he is allowed little or no control over the management of a job it is only natural that he should be relieved of much of the responsibility for the difference between the estimated and actual cost. This continual undercutting by estimating clerks in many contracting firms has resulted in a regular system whereby in the majority of cases work is obtained at a figure which is often unprofitable and sometimes ruinous to the contractor. Then, again, contractors with large staffs always find it necessary to have a certain quantity of work on hand, even if the profits are reduced to the vanishing point, because it would be more disastrous to keep the staffs unemployed. Of course those engaged in the building trade despair of any alteration in the system, and therefore they try to make their profits by the substitution of inferior work, or upon the extras and from fortunate circumstances. We suggest that the remedy may be sought in the following directions. Builders should come to the conclusion that to continue in the present system is simply suicidal. They should decide that their estimating clerks

shall put in a fair price which will leave an adequate profit, and, if they lose the job, not subject their clerks to censure. Moreover, the estimating clerk should be given a more prominent place in the business. He should be chosen for his general knowledge and constructive ability, and should be given the supervision of the job for which he has successfully estimated, with power to see that no hitches occur and that there is no waste of labour; and finally he should be allowed to suggest improved methods of executing the work so as to effect economy. In fact, the estimating clerk should approximate more to the position of manager in English businesses and of the superintendent and head of the engineering department in American contracting firms. He should be a trained contractor's engineer with inventive capacity.

ONE or two cases have been brought to our notice recently of competitions in which there has been some suspicion as to the fairness of the assessor's award. This must necessarily be a very difficult matter to prove, but in well-informed circles a great deal is often known which does not get into public notice. The present is no occasion to talk about the integrity of the assessor, because he comes under the ten commandments just as much as anyone else, but we regret to have to call attention to the fact that his judgment may sometimes lean unduly towards the efforts of those who may be his friends or who may have some business connection with him, with the result that, in judging the designs submitted in a competition, some by total outsiders may be passed over more because they are by outsiders rather than because want of merit warrants their rejection. There is, perhaps, hardly a subject connected with architecture which gives rise to so much jealousy and dissatisfaction as competitions, and it is in the nature of things that the assessor's award should often be the subject of unfair criticism and quite ill-founded statements. At the same time it is not always the competitor who is wrong, and when it becomes a matter of suspicion of playing into the hands of interested parties it is time to protest. We leave it at that, to those concerned.

THE PLANNING OF DECORATION.

ARCHITECTURE is primarily proportioned construction, so that the first duty of the ornament which is associated with it is that the expression of the construction should not be denied or violated; and as construction is made up of a number of parts, the ornament naturally accents those parts and their combinations. A building has mass, stability and focus. Its mass is expressed by its surface, its stability by its perpendicular and horizontal lines, its focus either by its axis, its largest unit, or both. As it is made up of a number of integral parts or cells, the parts must correlate and group about one another, usually with the smaller units about the larger. These groups form stratifications and axes, and it will be found that a large proportion of the ornament applied to architecture is devoted to accenting these stratifications and axes. All decoration of string and belt courses and entablatures belong to the stratified type, while decorations of columns, pilasters, piers, mullions and many of the terminal forms belong to the type upon axes.

The decoration of the surface of a building is of minor consideration, and is merely to give scale, tone, or colour to the mass. As a building is made up of

Cells,

the main axis of each cell is its centre line, and therefore upon a void and not upon a solid or wall line; and because of this fact, and also that all architecture has grown either from the single cell or from a group of cells about the central one, the main axis of the majority of buildings is upon a void, not upon a solid; and as walls are above walls and cells above cells in ordinary construction, voids come naturally above voids, and openings are over openings on the same axis. So much is this the custom, and so long has it been felt to be an expression of stability which it is unwise to violate, that the axiom, solids above solids and voids above voids, has become universal in architectural design as far as construction will permit. When, as in the Ducal Palace in Venice or in the arcaded streets of Bologna, plain walls with comparatively small openings are carried upon supports, both the columns and lintel carrying such walls are given strong and vigorous treatment and the walls above as light a treatment as possible, either by texture or by delicacy of detail; and this is the mere common-sense of design expressing stability. As far as stratification of exterior is concerned, the wall is divided into storeys and has a crown or termination, and ornament is associated with the belt courses and cornices.

The Consideration of Least Importance upon the exterior of a building is the decoration of its broad surfaces, which in most cases are best left plain. If, however, for purposes of scale, tone or colour these surfaces are to be decorated, they become an all-over pattern, either a diaper or of parallel bands or forms suggested by the material of which the surface is built; for instance, if of brick the patterns are based on checkers or are stratified; if of stone, they accent each stone at either horizontal or perpendicular joints, or both; if of shingles or other lapped covering of small pieces, scale patterns are suggested. The most prolific motives are those of the so-called rustication of stones in which each joint is moulded, and borders are carried around the edges of the stones; the wall may also be stratified by projections and mouldings. The surface patterns upon the stones should be small in scale and even in tone.

Floor Treatment.

Floor patterns should be in one level plane, giving no impression by form, tone or colour of depression or projection. For this reason strong contrasts of tones, unless



352-354, OXFORD STREET, LONDON, W. GEORGE HORNBLOWER, F.R.I.B.A., ARCHITECT.

These premises have just been completed for Jane Mason & Co., whose business was carried on for many years in the old buildings pulled down last spring. The drawing shows the front portion of the new premises, in Portland stone, with shop front and first floor arcade in teak. Messrs. Hall, Beddall & Co. were the contractors. The internal fittings on the ground and first floors were executed in oak to the architect's details by Messrs. Sage & Co., and the carving to the fronts was modelled and executed by Mr. J. W. Sparrow, also from Mr. Hornblower's design.

in very small scale, should be avoided, as should also all marked impressions of overlap, interlace or embossing. As many of the Oriental patterns are entirely free from these qualities they are peculiarly adaptable to floor designs.

In cases where the floor is entire it requires its principal ornament around its edge as a border to define it from the wall. Manifestly a floor should not appear to sink or to be depressed at its centre; on the contrary, it is better to have the impression of its being crowned at the centre; and as dark tones retreat, the border, rather than the centre of the floor, should be the darker, either in tone or by amount of detail.

As the floor is under foot, and as all ornament is less noticeable below than above the eye, elaborate systems of floor decoration are labour thrown away; the true purpose of the decoration of a floor being that of a foil to the remainder of the room. The ornament, therefore, should be less conspicuous and smaller in scale than that on the walls, and as the floor is seen more in perspective than either the walls or the ceiling, involved or complicated designs upon it become confused; simple geometric

systems of planning being much more satisfactory.

Wall Treatment.

In the decoration of a wall the usual effect of horizontal bands or zones is to lower the wall and to lengthen it; and this fact more than any other tends to determine the number and proportion of the subdivisions. It is evident that the narrow zones should be toward the top to avoid the appearance of overpowering weight upon and consequent compression of the lower zones, and the same reasoning causes lighter tones and detail at the top than at the bottom. The introduction of minor zones, such as superdados, sub-friezes, &c., which appear in Victorian English decoration, is unnecessary and confusing.

The main point of definition being at the base and cornice, each advances rather than retreats, and the base being below the eye receives slight attention, while the cornices become elaborate. The strength of detail, of tone, and of scale diminishes upward to avoid heaviness at the top of the wall; this should not be overlooked.

Panels.

The further treatment of the walls between openings is forced into a panelled treatment

of greater or less scale; and the wall with the greater number of openings sets the scale for the plain wall with fewer. The panelled treatment may be simple fields with borders as at Pompeii; or divided with pilasters and columns, as in Renaissance interiors; or have marked perpendicular treatment, as in the chateaux on the Loire; the surface may advance and retreat and become most elaborate in modelling and colour; but always the openings and the spaces between them set the scale. It will therefore be found that as these openings are usually higher than they are wide, unless there be a very much greater area of wall than opening, perpendicular rather than horizontal treatment is applicable to most walls of interiors; the exception being when windows are so grouped that the width of the group exceeds its height, and when openings are insignificant.

The Cornice.

uninterrupted by openings, defines the wall from the ceiling, and therefore projects at a greater or less angle. At times it is coved, carrying the wall surface over into the ceiling surface, in which case the cove is the dominant of the group of mouldings forming the cornice. If the ceiling is enriched the cornice becomes heavier in proportion to the enrichment upon the ceiling, unless the latter be frankly of panelled beams which are carried on the top of the wall, in which case the cornice is not necessary.

As the cornice is in most cases a group of mouldings, and therefore band ornament, it can be treated as a band or belt, while the frieze below it, equally uninterrupted by openings, becomes an excellent field for either continuous ornament or specialized ornament at regular intervals on axes. Cornices break naturally around projections, but it is superfluous to break them on the runs between projections except to define some axis strongly. Cornices immediately above openings require sufficient depth to appear as supporting beams spanning the opening.

Ceilings.

The decoration of ceilings depends very largely upon the importance of the room and its purpose. Usually small rooms require little ornament upon the ceiling. Rooms are naturally of two classes—those which are merely backgrounds for the furniture, &c., within the room, and those which are complete in themselves and require but few accessories; to the latter type belong the more highly ornamented walls and ceilings. The flat ceilings in one plane are practically large panels defined by the walls, and require panel treatment, *i.e.*, with borders or with centre motives, or both, care being taken that the centre of the ceiling does not appear lower than the sides. To avoid this effect the centre ornament should not have either too much projection, too large a scale or too strong a tone; and it is advisable to have the design of the border more vigorous than that of the centre.

Darker tones in the ceiling than in the walls produce the effect of a heavy ceiling, for which reason, unless there are strong supporting motives in the ceiling, such as beams from wall to wall or rich projecting divisions between panels forming a framework apparently capable of self-support, it is well to have the tone of the ceiling lighter than the wall. This is also dependent upon the apparent carrying capacity of the wall, for walls with deep reveals, indicating thickness, or with high broad surfaces, which also apparently necessitate thickness, or with pilastered or columned treatment, can carry heavier and richer ceilings than thin walls or walls pierced with numerous openings.

Borders on Flat Ceilings

come immediately in contact with the upper part of the wall, and if undefined from it by cornice lines require careful harmony or treatment with the design upon the wall,

having similar intervals of repeat; in fact, the top of the wall, the cornice and the border of the ceiling should always be designed together, not as separate designs. Corners of ceilings, contrary to those of floors, are adaptable points of interest for ornament, though liable to disturb the scale.

Beams

in ceilings must be manifestly deep enough and of proper intervals apart to carry the floor or roof above; the spaces between the beams becoming panels, subject to panel treatment. Alteration of beams, cross beams and framework patterns produce coffered ceilings of the richest type, the coffers being recessed to greater or less depth at will, and treated in the same or different tones from the framework, which takes the form of a geometric pattern extending over the entire ceiling and dividing it into panels of various shapes. When the framework becomes delicate and of slight projection, it is advisable to keep the tones of the frame and the panel near to each other; the heavier framework allowing greater contrast of tone and colour. Upon the framework, ornament is naturally placed at the juncture of the pieces of frame. Each piece of frame is a band and can be treated as such.

Vaulted Ceilings

are based on arch construction, and the lines of intersection of the arches are the salient lines of ornament, being bands, or borders, or ribs, strongest in their centre lines, and with ornament either in repose or following the lines upward. The spaces between these lines become panels of many forms, the ornament upon them being subordinate in scale or tone to the construction lines; and it is inadvisable to subdivide these panels excepting by some geometric framework or lattice of less strength than the arch lines.

At the points where the arch lines group, rich ornament can properly be placed, such as caps or corbels at the base of the lines; and bosses, rosettes, knots, pendants, &c., at the crown. Parallel bands as borders or arch lines, whether of mouldings or of flat decoration, apparently strengthen the construction; while exceedingly heavy centres in the panels apparently weaken it. Single vaulted ceilings, such as those spanned by barrel-vaults, can be heavily coffered; but all coffering of ceilings of interlacing arches requires lighter treatment to avoid violating the apparent strength of the rib lines. The tympana left by the barrel-vaults at the



HARROGATE PUBLIC LIBRARY. HENRY T. HARE, F.R.I.B.A., ARCHITECT.
(Royal Academy Exhibition, 1905.)

This library is now being erected and is expected to be finished by the end of the year. The stone used is from the Pateley Bridge quarries. Messrs. Barber Brothers, of Hampsthwaite, are the general contractors.



ASSEMBLY ROOM, SUTTON COLDFIELD TOWN HALL. ARTHUR R. MAYSTON, ARCHITECT. (Royal Academy Exhibition, 1905.)

This town hall, with fire-station attached, is now in course of erection at a cost of between £10,000 and £11,000. The assembly room shown above is planned to seat 650 persons, and has a large platform with dressing-rooms and accommodation for both sexes. It is approached by entrance and crush halls of ample width, with cloak-rooms opening from same, and a large supper-room is provided, with kitchen arrangements attached. The fire-station comprises engine-room with recreation-room over, stabling for four horses, hose tower, &c. The contractor for the work is Mr. T. Elvins, of Birmingham, and the architect is Mr. A. R. Mayston, A.R.I.B.A., of 11, Great James Street, Bedford Row, London.

end walls of the room are of unique shape and capable of specialized treatment of great interest. Vaulted ceilings do not require a continuous cornice below them, sections of the cornice forming caps or corbels at the points where the arch lines meet the perpendicular walls being sufficient.

Pendants.

Ceilings with hanging forms or pendants, as at Troyes or at Rosslyn Chapel, and stalactite ceilings, as at the Alhambra, need a strong initial background surface, manifestly capable not only of supporting itself but also all forms hung upon it; and as an arch over a span can unquestionably carry more than a beam over the same span, the ceilings are best when the background is an arched or vaulted form; in fact, pendants from a flat ceiling should be associated with a strong framework pattern upon the ceiling. In all cases numerous small pendants or stalactites are more agreeable than a few large or apparently heavy ones; and the construction scheme should be carefully worked out in the mass before the detail is applied. The form of the pendants should decrease downwards and partake of the character of hanging forms, not of mere masses fastened as a deadweight upon the surface. It is not unusual to find such forms at a point of departure for chandeliers, &c., from the midst of a plain surface; and in most cases they are unsatisfactory, the tubing or rods of such fixtures appearing lighter when piercing the heart of a flat ornament, such as a rose or circle. The Oriental stalactite ceilings are extremely interesting; they are built of a series of carefully related units, each of which does its work in supporting those about it.

Pendants from keystones can be heavier than at other points, for obvious reasons.

NOTES ON RUSSIAN HOUSES.

THE timber-built dwellings of even the richest landowners in Russia lack the picturesque construction familiar to travellers in Switzerland, Norway and Sweden. The walls are generally formed of square beams from 1ft. to 1ft. 6ins. thick, laid one on the other and neatly joined at the corners. They are fastened together by wooden bolts, sometimes 3ft. long, driven in at short intervals. The interstices are made air tight with moss saturated with pitch, then dried in the sun, and the whole is covered inside and out with a sheathing of thin planks.

The old houses have thatched roofs, like those of the peasant's cottages, but more modern dwellings are shingled. The rooms are almost always lofty, and some of them, notably the drawing-room and the dining-room, are of large dimensions. The plaster walls are tinted with a wash of some light shade for the drawing-room and bedrooms, and a darker one, possibly brown, for the dining-room. The furniture is simple, often home made, or, as is frequently the case of late years, one of the cheaper varieties of American and English manufacture.

Underneath the building is a great store equal to the house in area, and divided by partitions. The central space is occupied by a bed of carefully dried sand, in which are planted roots to be used during the long months of winter—parsnips, carrots, turnips and the like. Huge casks and barrels filled with salt beef, fish, half-fermented cabbage and beetroots are kept here also, and these form an important part of the winter diet.

Buildings in St. Petersburg.

In St. Petersburg the height of private buildings, irrespective of the number of storeys, must not exceed the width of the street on which they are erected. Height is

limited by the distance from the pavement to the point where the roof begins. In public places and open spaces, as well as streets more than 77ft. wide, private buildings for living purposes must not be higher than 77ft. In case a building is erected on the corner of two streets of different widths its height can be the same on both streets, even if such height should exceed the width of one or the other street. The least height permitted for any building, irrespective of the width of the street on which it is erected, is 12ft. 9ins., on the following basis:—(a) In those parts of the city which were not inundated during the flood of 1824, or where the water did not rise to the height of more than 2ft. from the pavement, permission is given for the erection of one-storey buildings to the height of not more than 12ft. 9ins., counting the height from the pavement to the beginning of the roof; counting from the pavement to the beginning of the floor, 2ft. 4ins., and from the floor to the roof, 10ft. 5ins.; (b) in those parts of the city where the water stood more than 2ft. above the pavement the foundation must be carried to the height of 7ins. above the water line of the floor, and the storey of the building must have a height of 10ft. 5ins., counting the height from the floor to the roof.

The R.I.B.A. Report on Brickwork Tests conducted in 1895-7 by a sub-committee of the Science Standing Committee of the Royal Institute of British Architects has just been published in volume form, price 6s., from the offices, 9, Conduit Street, Hanover Square, W. These well-known tests have been summarized in "Specification" for years now, but we shall take an opportunity of referring to this volume more in detail next week.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



"ROZEL."



"ROOKWOOD."



"FRESTON TOWER."



"FRESTON TOWER."

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

THE PLACE OF SCULPTURE.

THERE seems to be much agitation in Liverpool art circles over what is described as a boycott of the autumn exhibition at the Walker Art Gallery by the whole body of sculptors in this country. . . . The position of affairs has apparently been brought about by a disagreement between the Arts Committee of the City Council and the executive of the Society of British Sculptors. This society, which has been recently founded to safeguard the interests of our sculptors, made a demand that special accommodation should be provided in the gallery for the examples of sculpture contributed to the exhibition, and that the sculptors should be represented on the hanging committee. As the Liverpool authorities were unable or unwilling to agree to these conditions, the members of the society declined to send their works to the gallery or to take any part in a show which did not offer them the opportunities they desired It is, on the whole, a fortunate matter that this question of the proper treatment of sculpture in public exhibitions should have been so effectively brought up. Sculpture has been too long trailed ignominiously at the heels of paint-

ing It has now taken the place to which it is entitled in the very forefront of the arts, and it has a right to demand the fullest consideration from the promoters of exhibitions. . . .—"Globe."

Sculpture at the new War Office.

Mr. M. H. Spielmann takes up the same attitude in an article in Saturday's "Daily Graphic" on the sculpture by Mr. Alfred Drury, A.R.A.—the pupil of Dalou—at the new War Office in Whitehall (of which the late Mr. William Young was the architect). The most satisfactory feature in the revival of the plastic art is, he says, the enormous amount of good work in decorative sculpture which is now being executed all over the country for the embellishment of buildings—the sort of sculpture which everyone can see, and possibly appreciate in its close relation to architecture. Not a few of our leading architects, such as Mr. Colcutt, Mr. Belcher and Sir Aston Webb, have taken special pride in securing the union of the two arts, so that we lately witnessed not only sculptors of the grade of Mr. Thornycroft and Mr. Frampton, but many extremely accomplished and able men of non-Academic rank, such as Mr. Stirling Lee, Mr. Derwent Wood, Mr. Turner, Mr. Hodge, Mr. Hampton

and Mr. Bertram Mackennal, engaged in decorative work for the exterior of public buildings, and even of private houses.

"The opportunities offered by our new national offices and similar edifices are obvious enough, but they have not always been seized. When the Foreign Office was erected Mr. Armistead was commissioned to fill all the spandrels facing Whitehall, and admirably he fulfilled his task. On the other hand, pedestals intended for statues are too often left unoccupied, and empty niches cry out for the figures which a false economy has suppressed."

Referring to the War Office, Mr. Spielmann says: "For this great national building, which the architect did not live to see completed, Mr. Drury was commissioned to execute four colossal groups . . . and he has gone, probably, far beyond what was expected of him by revealing a power of thought and invention, and a capacity of handling a big conception realized on a big scale, of which his previous charming work had given promise rather than proof. He has thus justified himself and the selection of the authorities in the vast personifications of Peace and War, which, seated in Michael Angelesque juxtaposition, decorate the angles and side faces of the building. . . . The figures are more than double life-size, and when I saw them in the clay in the great studio erected for the sculptor on the site of the new buildings, I was impressed by the masterly ease of the treatment and the breadth of the modelling, accurately suited to work destined to be viewed from a distance. One thing is inexplicable—the introduction (by the architect, it is to be presumed) of the Royal crown, realistically fashioned, surmounting the pier between the figures, out of all harmony with the sculptor's manner and style—a lumpy form that detracts in some measure from the artistic completeness of the whole."

OUR PLATES.

THE following are some particulars of the residences erected on the Grass Park Estate, Finchley, N., from designs by Messrs. Bennett & Richardson, architects and surveyors, of 2, Broadway, Church End, Finchley:—

"Freston Tower" is situate in Hendon Avenue. The materials used are red facings for the ground floor with stone dressings, the first floor being carried out in half-timbered work with rough-cast panels and weather-tiling. The roofs are covered with Broseley tiles. The drawing-room of the house is decorated in Louis XIV. style, and the dining-room, billiard-room and hall have ceilings panelled with heavy beams: the flooring to these rooms being oak parquet. The house is heated throughout with hot water, in addition to "Gipsy" well fires. Messrs. Patman & Fotheringham, Ltd., were the contractors.

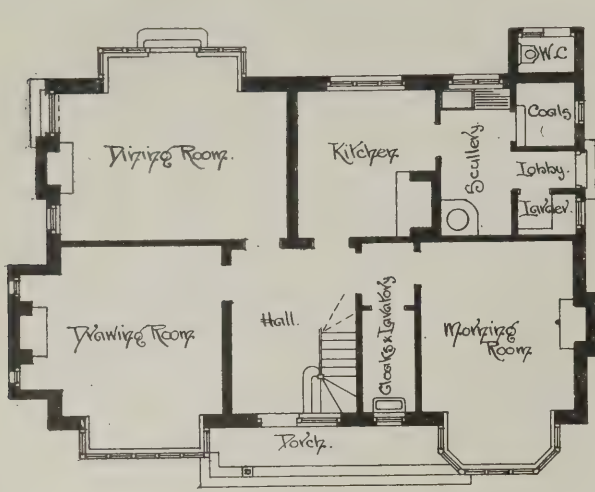
"Rookwood," is built with red sand-brick facings and half-timbered work with rough-cast panels on the first floor. The roof is covered with Broseley tiles. The two oriel windows to the staircase are glazed with stained glass. The floors of the dining-room and the hall are laid with oak parquet and polished. The ceilings to the reception rooms and hall are panelled. The stabling at the rear of the garden has accommodation for three horses, harness-room and large coach-house and coachman's rooms above. Messrs. Patman & Fotheringham, Ltd., were also the contractors for this house.

"Rozel" is in the same avenue as "Freston Tower" and "Rookwood." The materials used for the exterior are red-brick facings with lime-dash rough-cast and weather-tiling. The roof is covered with Broseley tiles. Messrs. Walter Lawrence & Sons, of Waltham Cross, were the contractors.

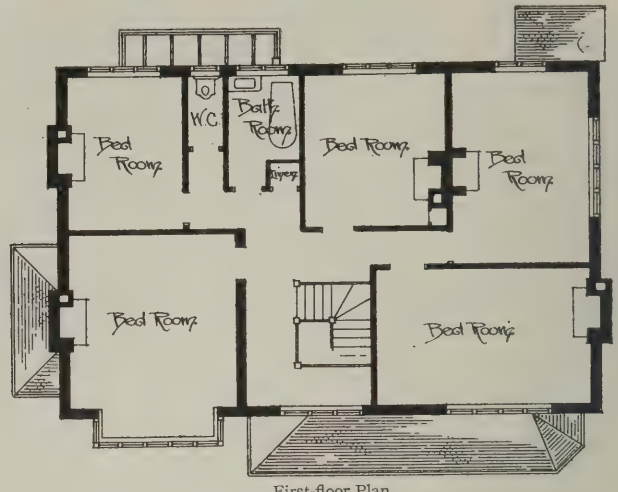


NEW PORCH, ST. MARY'S CHURCH, LANCASTER. AUSTIN AND PALEY, ARCHITECTS.

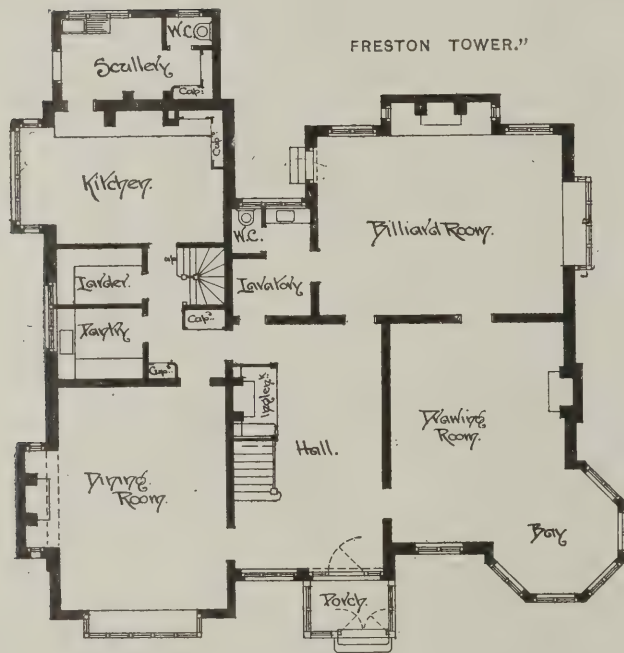
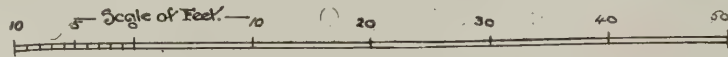
This porch takes the place of a very inadequate one of debased design. It was designed by Mr. H. J. Austin, the porch being the gift of his wife, who erected it in memory of her parents. It is built of a mixture of Lancaster, Darley Dale and flecked Ru corn stones, harmonizing in colour with the adjoining old aisle wall. The room on the first floor is used as a library, and is approached by a circular turret stair. The ceiling below is stone-groined with carved bosses. Over the doorway is a niche containing figures of the Virgin and Child; a carved head of Edward VII. is introduced into the corbel under same, the porch having been erected in Coronation year. The work was carried out by the executors of Mr. W. Harrison, Lancaster.



"ROZEL."

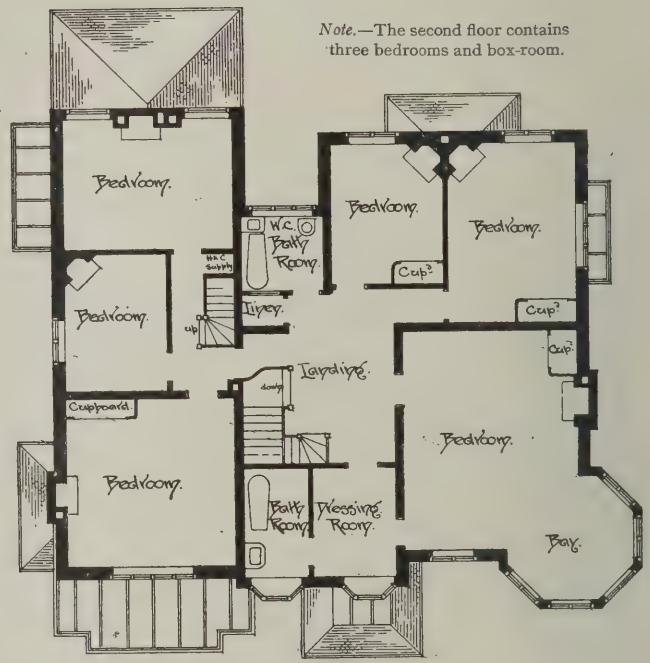


First-floor Plan.



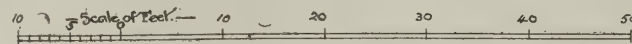
"FRESTON TOWER."

Ground-floor Plan.



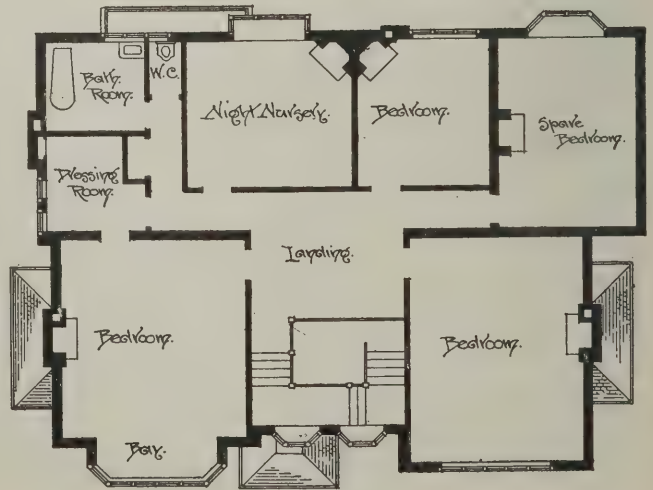
Note.—The second floor contains three bedrooms and box-room.

First-floor Plan

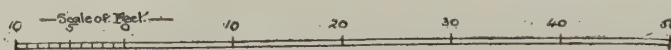


Ground-floor Plan.

"ROOKWOOD."



First-floor Plan.



TINTERN ABBEY.

Stonework of the Great East Window
Reset.

DURING the past year a considerable amount of work has been carried out at Tintern Abbey under the supervision of the architect, Mr. F. W. Waller, for the Crown. Most important has been the work connected with the great east window. After a careful examination of this window, it was found that the walls and buttresses, the jambs and arch, and the gable over, though much affected by weather, were on the whole fairly substantial and not much out of the perpendicular, but the large centre mullion and the remains of the tracery in the head of the window were in a very dangerous state. The large mullion was built in two sections, the outer half being of hard stone and the inner half of stone of a much softer character, and these were bonded at long intervals by a few narrow through stones. The mullion was much out of upright and had been supported by an iron stay. The large stones forming the main outlines of the tracery above had sunk and twisted out of place, and the joints had opened to such a degree as to occasion surprise that the stonework still remained in position, and especially so in view of the weak and unreliable state of the mullion beneath, which constituted the sole support. The utmost care and consideration were bestowed upon the problem of how best to deal with the stonework with a view to its permanent preservation without alteration or addition; a number of different schemes were drawn out and discussed, and ultimately what appeared to be the only thoroughly satisfactory solution of the difficulty was adopted—namely, the stonework was reset. Most fortunately, some pieces of the main tracery which had fallen were found; thus it was possible to complete the large ring in the head of the window as formerly existing, and at the same time add to the stability of the whole. The gable above and window therein and walls adjoining have been protected and pointed to exclude wet, and the whole work has been effected without any structural change or alteration in appearance, which is matter for much satisfaction, considering the unique character of Tintern Abbey and the history enshrined in its walls.

Transepts.

In the south transept and north and south aisles the sills of windows have been repaired and reset where necessary, and much needed works have been carried out in connection with the preservation and repair of the refectory and the readers' pulpit therein, the lavatory and the walls adjoining, and the kitchen and other offices. The important work to the sacristy, begun in 1904, has been safely and satisfactorily completed, as also that to what now forms the public entrance to the building.

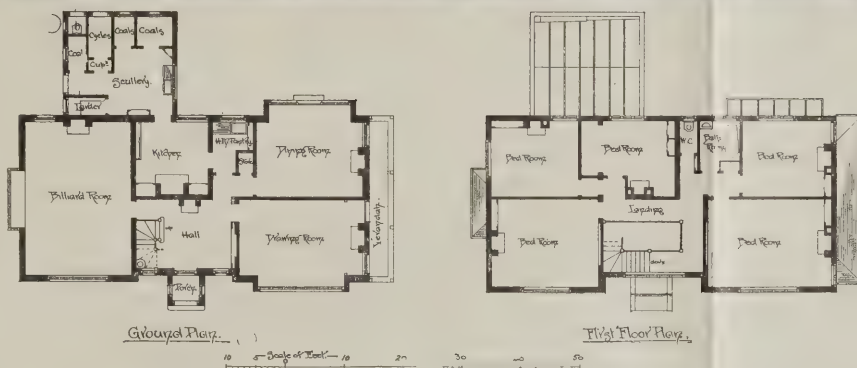
A large amount of very important work still remains to be done, the most pressing being that in connection with the eastern arch of the tower, which is much crippled and out of place; its fall might be productive of almost irreparable damage.

Competitions.

Holy Trinity Church, Failsforth, Manchester.—The design of Mr. Frank Freeman, of Bolton, has been selected and approved.

Library at Greenwich.—A competition is to be held for a branch library at Greenwich on the site of Bexley House. Mr. A. W. S. Cross, F.R.I.B.A., will be the assessor.

Carnegie Library, Burntisland.—Mr. William Williamson is the successful architect for this library, which is to cost £3,500. Mr. Washington Browne was the assessor.



"IRVINGTON," MILL HILL, LONDON, N.W. BENNETT AND RICHARDSON, ARCHITECTS.

This house is built of red facing bricks on the ground floor, with half-timbered work with rough-cast panels above. The roof is covered with Broseley tiles. The billiard-room and dining-room ceilings are panelled out in Oregon pine beams, and the staircase is executed in the same wood, but stained a dark oak colour and finished with egg-shell varnish. A verandah is formed on the east side of the house, affording a splendid view of the surrounding picturesque country. Messrs. F. Gough & Co., of Hendon, were the contractors.

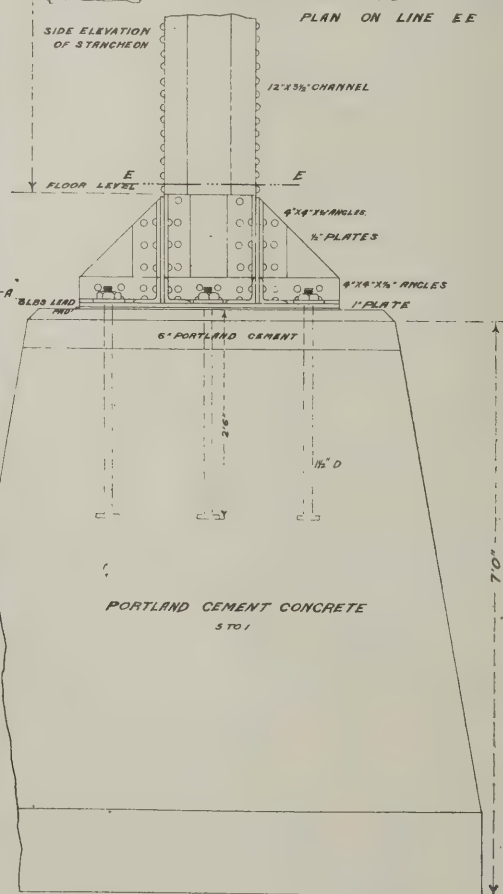
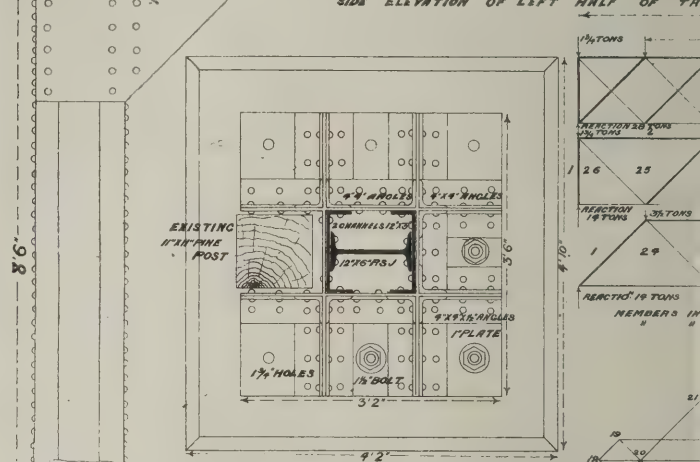
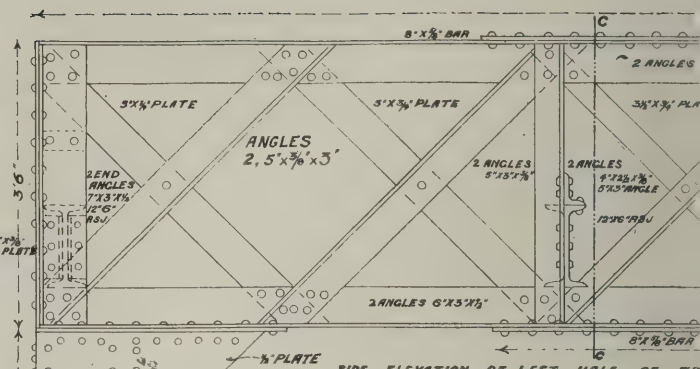
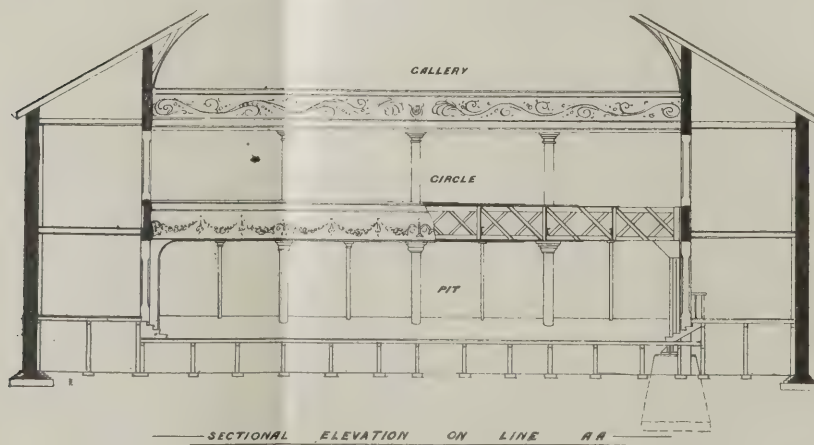
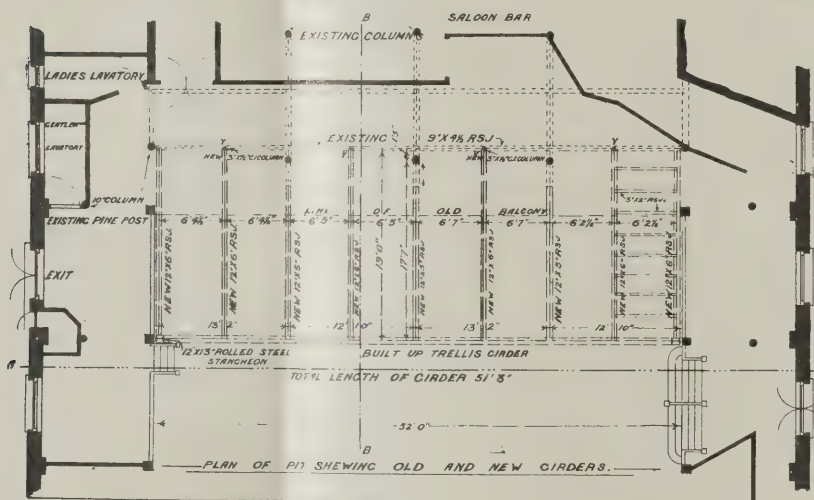
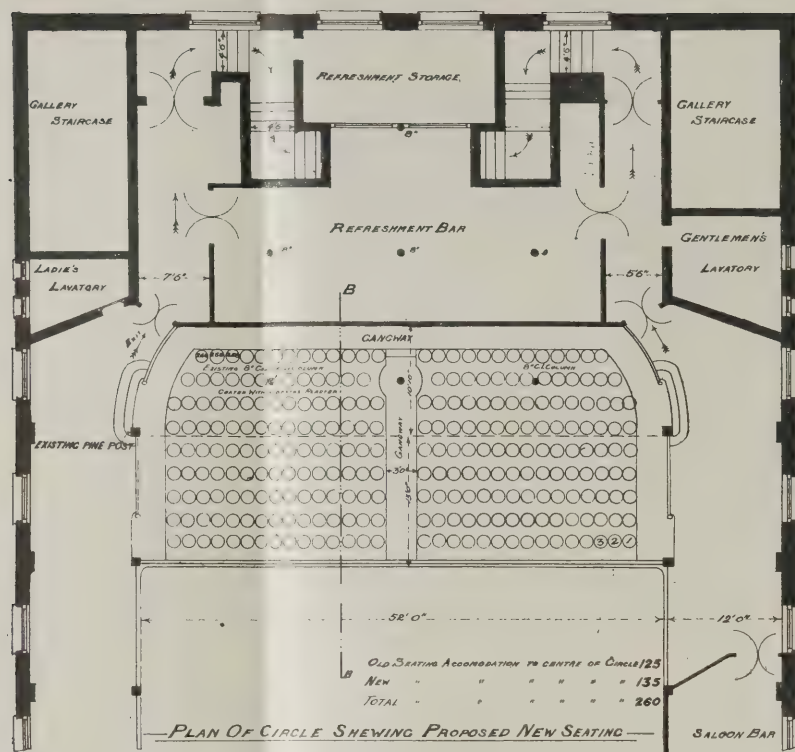
THEATRE ALTERATIONS.

THE sheet of details on the next two pages illustrates the alterations at the Grand Theatre, Brighton, which have been carried out by Mr. J. W. B. Blackman, P.A.S.I., architect, of Brighton. This theatre, formerly called the "Eden," is in North Road. It is of rather old construction, and a good deal of woodwork still remains, although the place has frequently been altered and improved; years ago it was used as a circus. The present lessee, Mr. E. Carpenter, has made many improvements, and just before Christmas, 1904, wished the circle to be brought forward 13ft. beyond an existing 6ft. cantilever to the pine posts shown on the accompanying plan, this giving extra seating accommodation for 135 people. The lessee insisted that there would not be any obstruction to interfere with the view of the stage from the pit, and the only way to get over the difficulty was to put a trellis girder across, with a clear span of 52ft. Such a girder was therefore built (as per detail) and supported at either end by rolled steel stanchions. Cross-girders 10ft. long were then fixed from the existing girders to the trellis girder and jointed as shown. The town authorities insisted upon the small cast-iron columns, y, though the architect considered that they were not necessary. A concrete floor 19ft. by 52ft. was set over the whole of the new area, and rolled steel joists 5ins. by 2ins. were laid 2ft. apart and encased with 5 to 1 ordinary coke-breeze concrete. All new steelwork was cased in asbestic plaster. The trellis girder

and stanchions were first covered with expanded metal, and the plaster then floated and set on it. The trellis girder acts as a front board to the circle. The architect estimated the total live and dead loads at 56 tons. The vertical member in the trellis girder was not taken into account in the graphic static diagram, as it was only put there to fix the cross-girders to.

With regard to the detail of the joining of the rolled steel joist marked x on plan, a query might arise why this was done. The existing girder was securely fixed to columns which supported part of the gallery above, and these could not be removed without great expense. The old cantilevers were cut off and jointed as shown by the detail. Some depth had to be gone down until the architect was satisfied with the foundations for the stanchions, as made ground and the remains of an old road were found. The stanchions were not put on a stone base, as usually done, but on 6in. Portland cement and sand 1 to 1 and 8 lbs. lead pad. The reason for this was that the workmen had very little room to work, as they were under two old floors and might not bed a large pad stone quite evenly, and the architect did not want to risk a crack by reason of uneven bedding. The contractors for the work were Messrs. Reed & Son, Ltd., ironfounders, &c., of Brighton.

The new Town Hall and Council House at Walsall was opened last Wednesday. It has cost £101,000. Mr. J. S. Gibson, F.R.I.B.A., was the architect.





Keystones.

The Strand Theatre is to be pulled down to make way for a station on the Great Northern, Piccadilly and Brompton Railway.

Change of Address.—Mr. Henry Hall, F.R.I.B.A., has moved from Doughty Street, W.C., to 20, Quernmore Road, Stroud Green, N. (Harringay station).

The Bingham Public Library at Cirencester was opened on Thursday. Mr. V. A. Lawson, of Cirencester and Stroud, was the architect. The total cost will be about £50,000.

The Obelisk in St. George's Circus, Southwark, recently removed to make way for a clock tower, has now been carefully re-erected in St. George's Road, not far from its old home.

"Gas and Oil Power."—The first number of this new illustrated monthly review for factory owners and other power users will be issued shortly. The offices are at 19, Ludgate Hill, London, E.C.

A new Police-station has been erected in Alexandra Road, Newport Mon., at a cost of £4,400. The contractors were Messrs. D. Richards, Ltd. Mr. C. F. Ward acted as architect, under the supervision of Mr. R. H. Haynes, the borough engineer.

New Municipal Buildings at South Shields.—The foundation-stone of these buildings, which are estimated to cost £48,000, was laid on Wednesday last. Mr. Ernest E. Fetch, A.R.I.B.A., of London, is the architect and Messrs. Robert Neill & Sons are the builders.

At Buckingham Palace an electric lift has been erected from what is known as the equerries' entrance to the upper floors. For many years, although repeatedly asked to do so, the late Queen would not permit this kind of alteration, but the demands of convenience have prevailed of late, and at least two lifts have already been fitted in the Palace.

His Majesty's Theatre, where a crack has developed in the wall above the proscenium of the stage, necessitating Mr. Tree's removal to the Waldorf, was designed by the late Mr. C. J. Phipps, and was the twenty-fourth for which he was architect. The builders were Messrs. Lovatt, of Wolverhampton, and the foundation work was done by Messrs. Patman & Fotheringham, Ltd., who now have the work of reinstatement in hand.

New Garden City.—Letchworth is likely to have a rival close at hand. The young Earl of Lytton has decided to develop the village of Knebworth by selling the land in small freehold plots for building purposes, and at the same time offering exceptional terms and deferred payment. The portion of the estate so dealt with is one of the prettiest and most interesting parts of Hertfordshire. The first plots of land were sold on Thursday. High prices were realized, reaching to £400 an acre and nearly £2 a foot frontage.

Mr. Waterhouse's Bequests to His Pupils.—To his "present and former pupils, in grateful recognition of their efficient and willing services," the late Mr. Alfred Waterhouse, R.A., left the following legacies:—Robert Ardley and George Tunstall Redmayne, £1,000 each; Alfred Spice, £500; John Willey, £300; George Steane, Isaac Steane, F. Herbert Mansfield, James Grosse and G. H. Shackle, £200 each; Winter Henry Raffles, the Rev. Ernest Geldart, Alfred Grosse and S. Powell, £150 each; Brightwen Binyon, Wilfred Hardcastle, G. R. Tatham, G. H. Gordon, John B. Gridley, Arthur Flower and Victor Flower, £100 each. By the first codicil to his will he bequeathed £1,000 to T. Frederick Pennington, but this is revoked by the second codicil, as Mr. Waterhouse intended to give this sum to his assistant during his lifetime.

Bristol Society of Architects.—Mr. Richard C. James, A.R.I.B.A., of Eagle Insurance Buildings, Baldwin Street, Bristol, has been elected hon. secretary and treasurer in place of Mr. H. Dare Bryan, resigned.

The fine Bronze Statue of the late Sir John Millais, R.A., executed by Mr. Brock, R.A., has been completed, and is now temporarily placed upon a pedestal in front of the Tate Art Gallery on the Embankment at Pimlico.

Partnership.—His uncle having retired, Mr. W. Hilton Nash, F.R.I.B.A., now carries on practice conjointly with Mr. Theo. Gregg (successor to the late Mr. Ebenezer Gregg, F.R.I.B.A.), at 1A, St. Helen's Place, Bishopsgate Street, E.C.

British School at Rome: Government Grant of £500.—The Board of Treasury has consented to propose to Parliament a grant of £500 to the British School at Rome, thereby extending the same support as that which for ten years has been given to the British School at Athens.

The Albemarle Hotel in Piccadilly, which is of terra-cotta and was designed by Messrs. Ernest George & Yeates, is now being cleaned by the Steam Brush Co., of Bloomsbury Square, W.C. A main pipe is brought out from the interior, and attached to it is a flexible hose, which is operated by a workman seated on a travelling cradle.

Kingsway—the new thoroughfare from Holborn to the Strand, with its crescent Aldwych—will be opened by the King on October 18th. The estimated gross cost of the improvement, including paving and other works and the cost of providing sites for rehousing purposes, is £4,893,750; while the estimated recoupment to be obtained by the sale of surplus land is £4,119,550; thus reducing the estimated nett cost of the scheme to £774,240. It is calculated by Mr. Maurice Fitzmaurice, the engineer, that at least 200,000 tons of earth and gravel have been dug out and carted away.

The Church of St. Erkenwald, at South-end, which is built on the highest part of the town and forms a conspicuous landmark from the sea, was dedicated on Thursday last. It accommodates 800 worshippers and consists of a nave of four bays, with a north aisle and morning chapel, a chancel of two bays and vestries. The nave and chancel are each 30ft. wide and 60ft. high to the apex of the vault, and the length is 126ft. A gallery has been introduced at the west end, and a wrought-iron screen marks the entrance to the chancel. The tower has not yet been added. When completed the total cost will be £15,000. Mr. Walter J. Tapper was the architect. Drawings of the interior and exterior of the building were exhibited at this year's Academy.

The new Workhouse Infirmary at Leicester was opened on Thursday. It is situated at North Evington and has cost £120,000. The infirmary is one of the largest in the kingdom, and will accommodate 520 patients, with provision for the erection of three additional pavilions, increasing the total accommodation to 900 beds. At present there are four ward pavilions, each 330ft. long and containing the following accommodation on each floor:—Two twenty-eight bed wards, two three-bed wards, two one-bed wards, two large day-rooms, two nurses' duty-rooms, with larders, and the necessary bath-rooms, lavatories and sanitary offices. The buildings have been heated by Messrs. Moorwood, Sons & Co., of Sheffield, under the patents of the Atmospheric Steam Heating Co., of London. The general contractors were Messrs. William Moss & Sons, of Loughborough (whose tender was for £79,575), and the architects were Messrs. Giles, Gough & Trollope, of London, their design having been selected in open competition.

The Staines Reservoir Communication Works were visited recently by the Junior Institution of Engineers. The members were shown round by Mr. Joseph Francis, the engineer, Mr. C. W. Pettit, representing the contractors (Messrs. John Aird & Sons), and Mr. Durham, of the Metropolitan Water Board. From the Staines reservoir intake the water will flow into a suction tank (one million gallons capacity), from which it will be pumped to a height of 24ft. into two subsiding reservoirs (300 million gallons joint capacity). Thence it will flow through 42in. pipes to the filter-beds, twelve in number. Sand-washing apparatus is provided and settling-tanks and coke-filters for treating the sand-washing effluent water before its delivery into the Thames. The filtered water will be pumped through a 42in. main to Cricklewood (13½ miles), where it will be again pumped 3¼ miles to a service reservoir at Fortis Green, Finchley, at a level of 298ft. above O.D. The engine-house at Kempton Park contains two first-lift engines, three second-lift engines and eight boilers.

South-western Polytechnic.—The lectures on architectural history given by Mr. Banister Fletcher, F.R.I.B.A., at this polytechnic in Manresa Road, Chelsea, during the past session have been very successful. Forty-seven students entered for the course, and at the examination held at the conclusion eight students satisfied the examiner (Prof. W. R. Lethaby, of the Royal College of Art). The names of the successful students are:—*William H. Champion, *Claire Gaudet, Herbert L. Jenkins, Alec Leman, Frank L. Fitness, Thomas G. Jackson, Oliver H. Kennedy and *Herbert Thatcher. (Those with an asterisk against their names received in addition a certificate of merit entitling them to compete for the sessional certificate in honours.) The scheme of instruction consisted of weekly lectures (at which carefully selected notes were given out), illustrated with lantern slides and specially-prepared large lecture diagrams, followed by sketching classes and further explanations of the styles. Large folio reference books of each style were supplied to the class after every lecture. In connection with the present course (which opens to-day at 7 p.m.) a series of visits to important buildings and museums around London is being arranged.

Obituary.

M. Charles Lucas, of Paris, honorary corresponding member of the Royal Institute of British Architects, died recently, aged 67.

Mr. John Melvin, architect, who died suddenly at Alloa on Saturday, was responsible for many of the chief buildings in the district.

Mr. H. G. Luff, F.R.I.B.A., of Devonport, died recently, aged 68. His architectural work included St. Barnabas's Church, Devonport, and the restoration of many churches in Devon and Cornwall.

Mr. Brightwen Binyon, A.R.I.B.A., of Bushey, died recently, aged 59. He was a pupil of the late Mr. Waterhouse, and after an Eastern tour commenced practice in 1871, retiring in 1897, when the work was continued by Mr. Frank Brown and Mr. Burgess, who had been associated with him for many years. Mr. Binyon won several competitions, including those for the corn exchange at Ipswich, Sunderland town hall, Swindon public offices and Folkestone public library. He was the architect of many schools and carried out a considerable amount of domestic work, including stables and alterations at Easton Park for the Duke of Hamilton.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

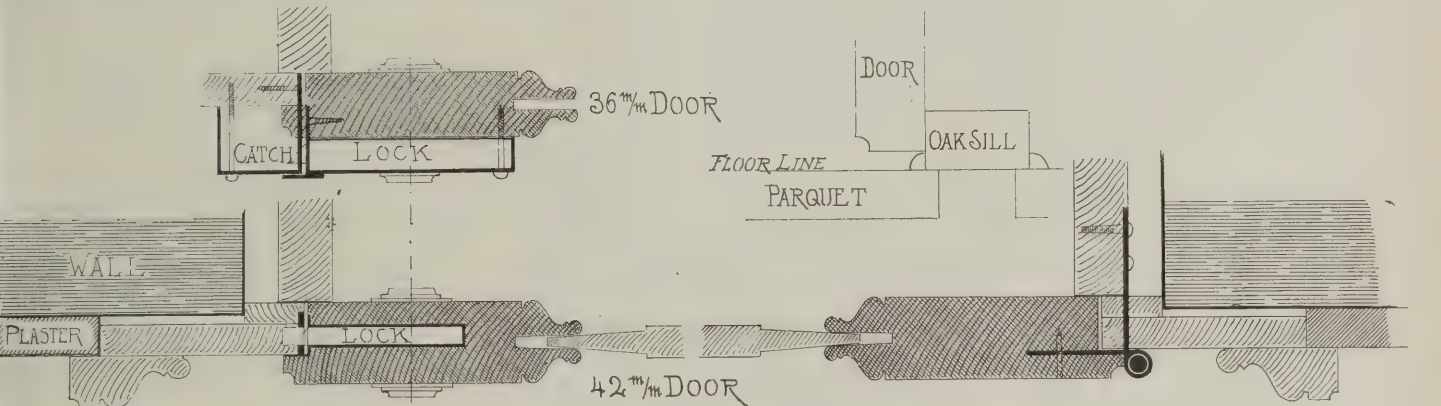
Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Obstruction of Light.

Brixton writes: "The accompanying plans (not reproduced) show a warehouse recently erected by A against some house property built about thirty years ago. B agreed to allow A to run his wall to a height of 26ft. 6ins. A, however, built the walls 4ft. higher. Do you consider this extra height has affected the light to the kitchen and scullery and rooms over? Also, do you think the erection of A's wall has seriously affected the kitchen and scullery windows? A has offered to cover the wall facing the scullery with white tiles. You will note A's wall is on the north side. There was not previously any building on the site of the



DETAILS OF DOORS AS USED IN SWITZERLAND TO PREVENT DRAUGHTS.

warehouse, but trees to a height of 15ft. or 18ft."

This seems to us a case of the last straw and the camel's back. There is no doubt that the original wall must have very much obstructed the light to both kitchen and scullery, though much the more seriously to the latter. The extra height proposed will make little real difference, though where the light is already bad every little addition for the worse is of importance. We consider the offer of the white tiles is a fair one, and should make both rooms better than they were before, but we would also offer to provide prismatic glass in both the top sashes, which would greatly improve the property and ought to overcome all objections.

A Bakehouse Chimney.

Farnham.—A. J. S. writes: "A bakehouse chimney shaft is required to be raised a few feet. Is this practicable according to sketch (not reproduced); and if so, how many feet could it be carried up with safety?"

By the London Building Act, which is a good guide for any other neighbourhood, a chimney stack should not be carried more than six times its least dimension above the roof without being stayed. The chimney submitted is already just over this height, so that it cannot be raised without considerable risk, as there do not appear to be any ready means by which it can be stayed with sufficient rigidity to be useful.

HENRY ADAMS.

Area and Air-space in Portable House.

LITTLEHAMPTON.—ERIQUE writes: "What superficial area and cubical air-space would be required for a portable house to seat about 200 people?"

The space allotted to each person should be not less than 2ft. 4ins. by 1ft. 8ins.; the gangways should not be less than 3ft. wide. The cubical air-space will depend upon the system of ventilation adopted; we presume that in this case the so called "natural" system is proposed. At least 300 cub. ft. of air-space should be allotted to each person.

Doors in Swiss Houses.

LONDON.—H. E. W. writes: "I understand that in Swiss houses the internal doors are rebated in some way in order to lessen the draught. A client of mine wishes to adopt the same system for some of the doors in his new house, but is not quite clear as to how it is done. Can you give a sketch and an explanation of the method?"

The accompanying details, by Mr. Alexander Koch—who has carried out much architectural work in Switzerland—will serve your purpose. They do not need any description. We may mention, however, that it is usual in Switzerland to have a sample door made for every building and to order the fittings to suit it. Mr. Koch advises that the same course should be adopted in your case,

surrounding plots it has then no right of lateral support in respect of that raised part.

S. P. J. M.

Sale of Building Land.

COLWYN BAY.—WALES writes: "(1) Is it usual for the vendor of a plot of building land to supply the abstract of title? (2) A, as vendor, chooses to act for himself in the sale of building land—that is to say, when the solicitor for the purchaser writes asking to see the vendor's deeds or title the vendor lends the purchaser's solicitor the deeds, as he thinks to prepare the abstract, when he receives from the solicitor a list of requisitions which the vendor answers himself, and to the satisfaction of both purchaser and solicitor. Now that the purchase is completed, the solicitor sends in an account to the vendor, as he says for supplying abstract of title. Considering that the vendor did not give any instructions whatever, is he responsible for the above solicitor's charge?"

(1) Yes, the vendor should supply the abstract of title. (2) I understand the case to be that the vendor merely handed over his deeds to the purchaser's solicitor and employed no solicitor himself. The purchaser and his solicitor concurred in this (rather loose) arrangement, and the matter is now at an end. I am of opinion that in the circumstances no costs can be recovered from the vendor. F. S. I.

Harrison's Graded Scale Curves.

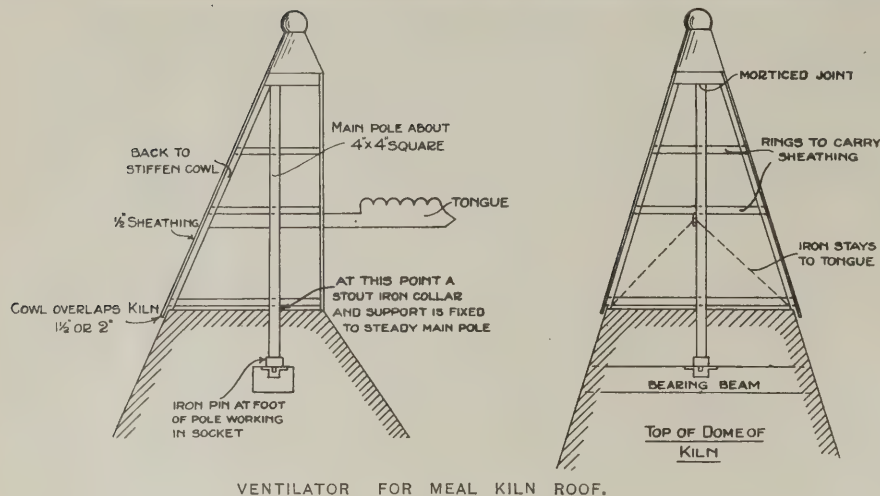
BONCAVE writes: "What advantages have Harrison's graded scale curves over ordinary French curves? I understand they are all the same shape but of different sizes. What is the object of this? I think a description of the curves would interest and be of use to many readers."

These curves were designed by Mr. J. Harrison, M.I.M.E., A.M.I.C.E., Wh.Sc., so as to give the most generally useful results in practical work. They are mathematically calculated. At one end the curve is very flat, at the other it is almost circular. Beginning at the flat end the curve gets more and more convex, gradually and continuously to the circular end, and at no point becomes flatter, like most other French curves, which interferes to some extent with their general utility. These curves are made in a series of four, 5ins., 8ins., 10½ins. and 13½ins., in pearwood, "pellucid" and "velo veneer," and they cost rs. 6d. the set in the first-named material and 10s. in the other two. They are supplied by Mr. A. G. Thornton, of Paragon Works, King Street W., Manchester.

Revolving Ventilator for Meal Kiln Roof.

DUNFERMLINE.—J. B. writes: "Please give a sketch of a revolving ventilator for a meal kiln roof. There is an old-fashioned one shaped like a cone, but is there any newer style?"

Where fans are employed cowl is no longer necessary, but in cases where natural



VENTILATOR FOR MEAL KILN ROOF.

draught is used for kilns there is nothing better than the old arrangement of conical cowl. The accompanying sketch, not to scale, shows how such is made. The chief part of the construction is the "pole" which carries the superstructure and on which it all revolves by means of a collar at the top of the kiln dome and an iron pin pocket joint of stout character carried in the bearing beam, which is fixed for that purpose in the upper part of the kiln. This pin bearing should be oiled, and if a sinkage takes place it is necessary to block up the cowl at this point (a marble in the socket often forms the best bearing). The "back" of the cowl carries rings of timber (made like the rings of a sinking kerb for a well), and to these $\frac{1}{2}$ in. wooden sheathing is affixed (by copper nails in kilns where sulphur is used). The sheathing must start on each side at the front. Each board should "weather" over its predecessor and the last at the "back" should cover the last pair. This is to prevent wind entering at the joints. The "tongue" is of course intended to keep the opening of the cowl to leeward and so to prevent draught.

F. S. I.

Honours, Building Construction.

LONDON.—J. H. S. writes: "The Board of Education have the following new regulation regarding their examination in Honours, Building Construction: 'No candidate will be credited with a success in this examination who has not obtained a previous success in stage 3, or in honours of the same subject, and who does not qualify in the Board's examination in architecture.' Would a second-class certificate in architecture be considered sufficient qualification by the Board?"

A second-class certificate in architecture is a sufficient qualification to enable a success in Honours, Building Construction to be recorded.

HENRY ADAMS.

Removing a Church to Another Site.

T. T. (Liverpool) writes: "Referring to the replies on this subject, two churches within my knowledge were removed and re-erected as 'A. L.' mentions. They were both in Liverpool. One, a church of England, is now on a site in Crown Street. This was removed from a site across the street, about 150 yds. away, to admit of the opening-out of part of the main-line tunnel of the London and North-Western Railway from Lime Street Station to Edge Hill. The other church now stands on a site on the north side of West Derby Road, near Tue Brook, and is known as Tue Brook Wesleyan Chapel. This building was removed from a site in Bootle about three miles to the north-west. Your querist will doubtless be glad to have these examples brought to his notice in addition to those already mentioned in your columns during the past few weeks."

A FINIAL BY SIR ROWAND ANDERSON.

THE finial illustrated below has been designed by Sir Rowand Anderson for the principal gable of the Sir William Pearce Institute at Govan. It was executed by Mr. Charles Henshaw, decorative metal-worker, of Edinburgh. As appropriate to Govan, renowned for its shipbuilding yards, the design takes the form of a ship, though an ancient example of Armada days has



been thought more suitable than a modern ship. It is fixed on a pedestal of stone and measures fully 6 ft. overall, with a width of 4 ft. 6 ins. At first the intention was to make the ship of cast bronze, but this idea was given up on account of the weight. Sheet copper was therefore chosen, which necessitated greater care and skill in construction. The framework is of wrought-iron, and every precaution has been taken to secure sufficient strength to withstand wind-pressure.

The Massive Tower Pinnacles of Bath Abbey Church, one of which was recently struck by lightning, have been taken down and are to be re-erected on a smaller scale, of which a wooden model has been set up on the base of the south-eastern one. They dated from the Gothic Revival, when it was a common mistake to make pinnacles disproportionately big. A new floriated cross has been placed on the eastern gable of the chancel. Mr. T. G. Jackson has the work in hand.

THE ANCIENT BUILDER.

What would he have done under Modern Conditions?

COMPARING ancient with modern building construction, the former could hardly be considered a science in any real sense, for it was generally, as in Egypt and Early Greece, the shaping of buildings by a homogeneous material, granite, stone or marble; having their prototype in some cases in rock-hewn caves and temples. But we now live in an age when the architect has at his command all the materials which nature as well as industrial manufacture can supply. Around many of them has grown up a special literature, and every student of applied science, every student of a technical school, and every craftsman is made familiar with the results and experiments of the most elaborate tests, which are to be found in every text-book.

What has all this analysis, classification and research done for the architectural or artistic use of these materials? Are our modern buildings equal in architectural merit or design to those of the ancients? Our answer to these questions is that we cannot compare the products of ages so far remote, which existed under such different conditions of life and habit. Analytical investigation is certainly not favourable to the art instinct in many ways, and if the experiments and conclusions of modern chemists, physicists and engineers had been known to the Greeks, Romans or mediævalists, the architecture they have left us would have been rather different, though we doubt if more perfect.

Could the Parthenon have been Improved?

The Parthenon could scarcely, under modern conditions, have been more perfect for its purpose or climate, or in the mode of lighting the cella, either by clerestory (as Mr. Fergusson thought) or by Bötticher's theory of a skylight. There was ample marble at hand, and nothing could have been gained by adopting more modern methods of wall building, and for the particular kind of religious worship in which the statue of the goddess was prominent the hypæthral temple, with its naos open to the sky, and the peripteral arrangement of the columns left nothing to be desired.

So that all our scientific research and analytical study have not had so much to do with the design of these great buildings of old; and to change of intention or motive we must look for any real difference in the design between the ancient and the modern.

What Gothic Builders might have done.

The great Gothic builders probably would have been more affected by the exact knowledge of materials we possess now, and how far the introduction of iron in their methods would have influenced them is a question. That they would have left us anything more noble or dignified than the cathedral churches of our land is also doubtful. The fact is, analytical knowledge and mechanical processes cannot in themselves inspire the creative faculties of the artist; and we must look to deeper causes—the ideals of life, modes of workmanship and religious unity and enthusiasm for any change in architectural construction.

But with the greater command of materials and processes of manufacture and the more exact knowledge we have of their properties and capabilities, there is no reason why corresponding advantages may not be secured if we look at the question in a true light. Our ancestors had only a few materials, which they thoroughly understood and used in the most direct and unflinching manner. If they did not know the chemical and physical properties of these materials as well as we do, they had a practical insight into their working, which is of far more importance

in design than the most profound analysis. They were handicraftsmen as well as designers and were more sympathetic with their materials and knew their limitations better than the modern tradesman, who has only studied his materials second-hand by the aid of books and classes. That we are gradually overcoming this defect by our system of instruction ought to be an encouragement. But we are too apt to use materials, at least the older of them, in precisely the same fashion as our forefathers, to do which we have to revert to their style first and make our reason and science come next—just the opposite way to that in which they worked. By thus reversing the order of their method we have made our art of no effect by our traditions. We have made our construction fit the form, instead of the form fitting the construction, which is the true way. Until we see this we shall go on blundering. Our better knowledge of science has at least enabled us to accomplish many things in construction.

To take a few examples, we may first mention

Our Methods of Making Foundations.

Here our scientific knowledge has certainly been a great aid to us and enabled us to erect buildings of the weightiest and loftiest kind on almost any soil—a feat which the old builders could not accomplish without the expenditure of a vast amount of material and labour. The destruction or failure of so many of our ancient church towers is a melancholy instance. Had our cathedral builders known the value of Portland-cement concrete, concrete piles, caissons and the aid of pneumatic appliances they would not have hesitated to use them; or had, even in later times, Wren used the modern methods now available to prevent the settlement of foundations due to drainage or sliding strata we should never have heard of any fractures (though these have been exaggerated) in the masonry of St. Paul's Cathedral.

The aids the architect now has to extend the bearing power of his heavy piers have made it possible to calculate for any load. Layers of dry material or stone, however hard and compacted, or lime concrete methods that the old builders resorted to, cannot be compared with a grillage of steel beams strengthened and solidified by cement concrete, as there can be no breaking away or fissuring under heavy loads, the reinforced concrete forming a solid mass stronger and more coherent than any stone.

Settlements.

The old builders knew how to distribute the weight of their structures by wide footings; but their modes of dealing with inequalities of earth resistance, wet or damp soils, lateral escape of soft soils, or running sand or peat, sliding of the substratum on sloping beds, withdrawal of water by well-sinking and drainage, were imperfect. We now have means of combating all these causes of settlement, such as by sheet piling, plank foundations, retaining walls, concrete or sand piles, and other means of obtaining a solid foundation; we use subsoil drainage before commencing to build in wet or damp sites. The modern expert can now calculate with a nicety the resistance of different soils.

Steel Architecture.

In the design of iron and steelwork an almost perfect system of construction has been introduced based on scientific principles and a knowledge of the materials acquired by experimental tests: and in this case there were no traditional rules and precedents to hamper the designer, as in the case of stone, brick or timber. Iron and steel construction has indeed formed the subject of an important literature; mathematical principles have been applied to the question till we have a body of reliable facts, experimental, mathematical and practical ex-

perience, which have placed the subject on a scientific basis unknown to any previous era of construction. All these advances in iron construction have very much specialized this branch, and have tended to keep iron and steel construction very much in the hands of a few experts who have made a particular study of it. It may be asked whether these advances have made any difference from an art point of view? Are our railway bridges and stations any better? We cannot say they exhibit any improvement in design; but the engineer is proceeding on safe lines, and it is only for him and the architect to co-operate to bring about a more satisfactory condition. The uses and limitations of these materials are now understood better than they were a half-a-century ago. But is it not time for architects to use these aids for their own purposes, and try to make them subservient to more architectural conceptions?—H. S. W. in "Architecture."

Builders' Notes.

The Bath Stone Firms, Ltd., made a nett profit of £18,509 for the half year ended June 30th last. The directors declare an interim dividend of 14 per cent. per annum, leaving £18,463 to be carried forward.

A £3,000,000 Contract.—Messrs. Hughes & Stirling, builders and contractors, of Liverpool, have secured the contract for the construction of a boulevard across the city of Madrid, to cost £3,000,000. The boulevard will be one mile and a third long.

The Jerry-builder.—First jerry-builder to second jerry-builder regarding a row of four houses, one of which has collapsed: "How is it that my 'ouse has fell? It's just the same as yours." Second jerry-builder: "Ah, but mine was papered inside."—The same facetious spirit to a prospective tenant looking over the houses: "Now you go into the next room." Shouts, "Can you 'ear me?" Answer: "No." "Can you see me?" Answer: "No." "Ah! there's walls for yer!"

Proposed Works Department for Leeds.—The special committee appointed to consider the advisability of establishing a works department at Leeds held a meeting last week, and discussed the matter. It was decided that the committee should first ascertain what other municipalities had done, and with this object four questions were formulated, to be sent to various corporations, including London, Glasgow, Birmingham, Liverpool, Manchester, Sheffield and Bradford.

Labour in the Colonies.—The Emigrants' Information Office states that it is too late in the season for the ordinary emigrant to go to Canada unless he goes to friends or has sufficient means to keep himself during the winter. In the six States which compose the commonwealth of Australia there is not much demand for more labour. New Zealand offers many advantages to emigrants both as regards its resources and its climate, and reduced passages are granted to those who possess a capital of £50. No one may enter Cape Colony unless he possesses £20 on arrival or has secured work beforehand. There is no opening for more labour, the supply exceeding the demand in nearly every department of industry. The supply especially of carpenters, bricklayers, fitters, riveters, handymen and painters at Cape Town, of men in all branches of the building and engineering trades at East London, and of men in all branches of work at Port Elizabeth, greatly exceeds the demand. At East London the wages of carpenters, bricklayers and plasterers have been reduced by 3d. an hour. In Natal labour is plentiful; neither do the Orange River Colony and the Transvaal offer any opportunities.

Decay of Stone in Glasgow.—Mr. L. W. Williams, on behalf of the Giffnock Quarries, Ltd., has asked the town council of Glasgow that a committee be appointed to enquire into and report upon the numerous cases of decay in the stones used in Glasgow buildings. He suggests that the principal buildings in Glasgow be classified, giving age and condition of stone with name of quarry appended. Certain points should be clearly brought out: (a) whether stones are laid on natural bed or on cant; (b) whether stones are dressed by hand or machine; (c) whether the stone specified by a certain quarry was all supplied by that quarry; (d) whether the stones of several quarries were placed in the one building.

THE ARCHITECT IN SOUTH AFRICA.

IN a paper on the training of architects which he read before the recent Johannesburg meeting of the British Association Mr. Reginald G. Kirkby, A.R.I.B.A., said that the old system of pupilage was slowly dying out; for as schools of architecture were being multiplied students were able to attend the classes and thus obtain a thorough grounding in the elements of their profession before entering upon practical work in the office of an architect. There was a crying need for a faculty of architecture to be fully developed in connection with university colleges, technical institutes and schools of art in South Africa, and until some additional means were provided to enable the young South African architect to obtain a proper theoretical training they could only hope to turn out rule-of-thumb men. There were practically no existing facilities for students to obtain the necessary training, although the R.I.B.A. had consented to hold examinations in South Africa.

He was glad, however, to notice that an attempt was being made by the Transvaal Technical Institute to partly meet the need, and it was to be hoped that the adjoining colonies would follow this example.

In regard to

Science in an Architectural Curriculum he said that a student should be taught the physical properties of building materials and their geological structure; he should take a course in chemistry, which would aid him to employ the materials most suitable to the various environments, and also to detect defects and impurities; acoustics (one of the most difficult branches of physics in its application), together with a knowledge of the movements of vitiated air, would enable him to understand more perfectly the principles underlying a much-neglected branch of his work; the laws of light and heat contained many applications in architecture, the effect of the latter on iron and steel structures being of great importance; while a course of magnetism and electricity would help the architect to carry out his electric-light installation in a proper manner; and it was needless to emphasize the value of a mastery of the laws of mechanics and graphic statics, for without a knowledge of these how could an architect construct? Just as a painter profited by his knowledge of anatomy, so did an architect by a knowledge of his materials, their strengths and uses.

Modelling in Clay

would be of great assistance to the student, in enabling him to judge correctly the necessary reliefs, depths and sizes of the ornaments forming part of his building. It might not be necessary for him to do the modelling or carving, but he should be able to tell when the work was well done and thus prevent the employment of sculpture which might not be in sympathy with the general design.

VIEWS AND REVIEWS.

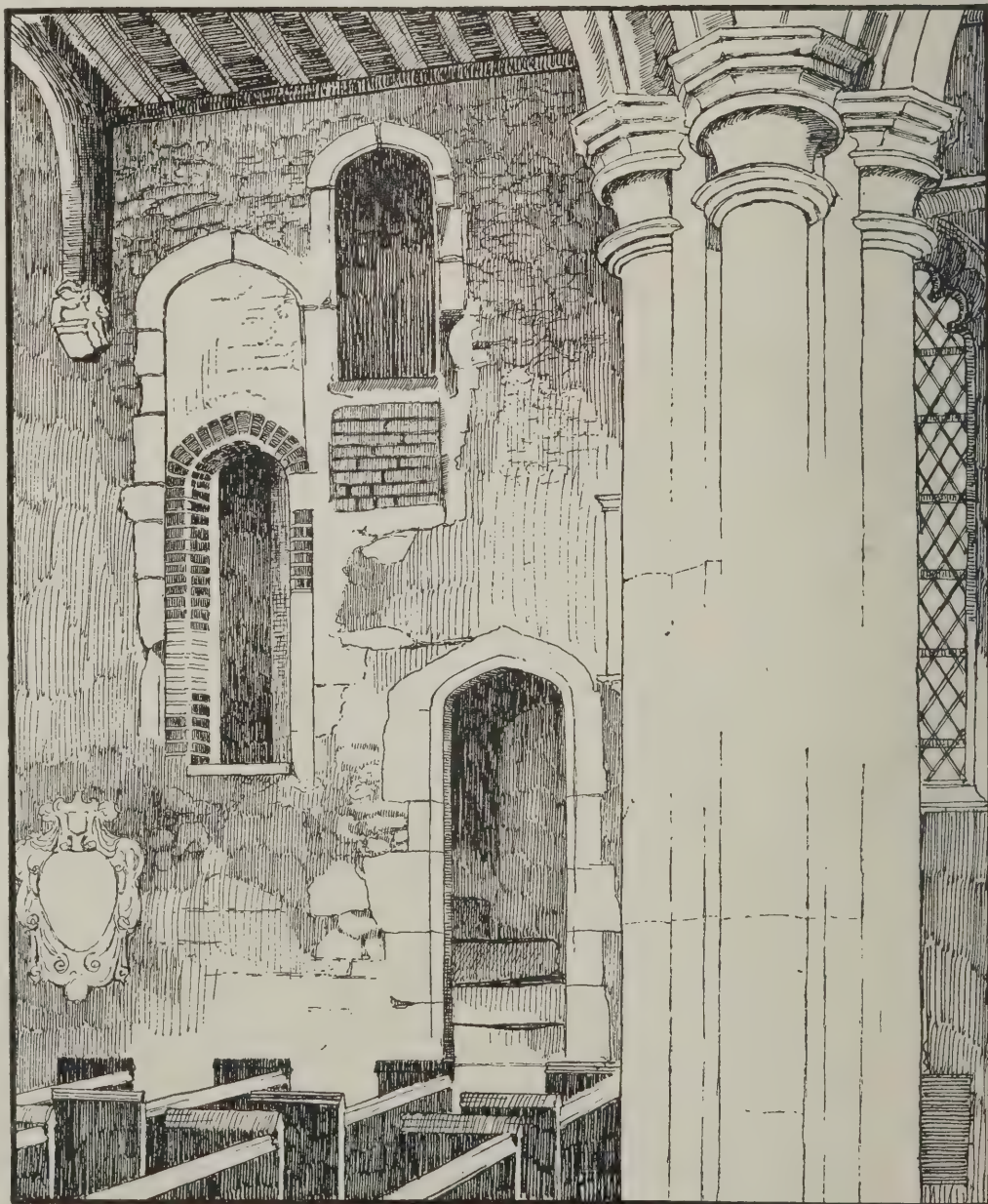
**The Church of St. Dunstan,
Stepney.**

From what meets the eye at the present day one would judge the Church of St. Dunstan, Stepney, to be of less interest than the history of it so ably summarized by the Hon. Walter C. Pepys and Mr. Ernest Godman, who are responsible for the letter-press of this book. Within the City of London it has never been possible to have parishes nearly so large as the original Stepney, which had become so populous by 1650 that proposals for its subdivision were made, with the result that it was divided into no fewer than nine parishes between 1669 and 1820. Forming part of the Hundred of Ossulton at the time of the Domesday Survey, the Manor of Stepney was held by the Bishops of London, whose palace once stood where Victoria Park now is. Such in brief is its history. The church was thus described by John Stow:—"This church of St. Dunstone is called in the East, for difference from one other of the same name in the West; it is a fair and large church of an ancient building, and within a large churchyard; it hath a great parish of many rich merchants, and other occupiers of divers trades, namely, salters and ironmongers." Excepting a Norman rood, now in the chancel, some Early English sedilia, and one curvilinear window, the church is in the Perpendicular style, and calls for little comment; but inasmuch as it forms the temple of its memorials, besides meeting the present need, its existence should be safeguarded, and as historic buildings in general are safer to-day than they were, there is reason to hope it may be. But whatever befalls the church, there is no memorial in it that will not be preserved for all time by means of this patient survey. The monuments in church and churchyard are all reverentially listed, and, though it cannot have in all cases been easy, the arms are correctly described. Some are printed in colour, too, showing how to do that for the rest, and since there is nothing more splendidly decorative than our heraldic devices, it is delightful to have them added to these most desirable volumes. A matter which "I would touch on," says Mr. Ashbee, "is the need for some better record of London families. There is, as far as I know, no system or method by which the records of English families, much less of London families, are being preserved. Sometimes their only memento is a stray tombstone, monument or inscription in a city church, or the church of what once was an outlying suburb and is now swallowed up in the great city. If any members of the Survey or any who are interested in the preservation of English historic record would, before it is too late, catalogue and classify (somewhat in the manner in which Mr. Pepys has treated the tombs in Stepney Church) all the ancient churches of London, and the outlying suburbs within the region of the Survey, I think a very valuable piece of history would be accomplished; and I commend it to the readers of this book." E. R.

The Church of St. Dunstan, Stepney. The Sixth Monograph of the Committee for the Survey of the Memorials of Greater London, 37, Cheyne Walk, Chelsea.



WEST END.



STAIRS TO ROOD LOFT SOUTH AISLE. DRAWN BY E. L. WRATTEN AND W. H. GODFREY.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :			
Oct. 5	Salford—Alterations	Corporation... ..	Borough Engineer, Town Hall, Salford.
" 5	Sunderland—School	Town Council	Vaux & Mark, Architects, 66 John Street, Sunderland.
" 5	Bristol—Culvert, &c.	Guardians	T. G. Scoons, Engineer, 10 Orchard Street, Bristol.
" 5	Carmarthen—Ventilation Works	Education Committee	W. D. Jenkins, Architect, Shire Hall, Carmarthen.
" 5	Aston Manor—Power Station	Corporation... ..	Borough Engineer, Council House, Aston Manor.
" 5	Sherborne—Alterations to Laundry	Guardians	H. J. Seymour, Clerk, Guardians Office, Sherbourn.
" 6	Buckfastleigh—Bakehouse, &c.	Co-operative Society	A. Warren, Architect, Fore Street, Buckfastleigh.
" 6	Ossett—Converting	Corporation	F. W. Ridgway, Architect, 11 Union Street, Dawsbury.
" 6	Blackburn—Rebuilding Turret	Guardians	F. C. Ruddle, Architect, 4 King Street, Blackburn.
" 7	Mountain Ash—Houses	Building Club	T. Millar, Architect, Mountain Ash.
" 7	Wrenthorpe—Classrooms, &c.	Education Committee	J. Vickers-Edwards, Architect, County Hall, Wakefield.
" 7	Eastbourne—Fire Station... ..	Corporation... ..	Borough Surveyor's Office, Town Hall, Eastbourne.
" 7	Pontypridd—Alterations	Urban District Council	R. P. Wilson, 66 Victoria Street, Westminster.
" 9	Mortlake—Addition to Hospital	Urban District Council	G. Bruce Tones, Surveyor, Council Offices, Mortlake.
" 9	Bournemouth—Shelters, &c.	Town Council	F. W. Lacy, M.I.C.E., Municipal Offices, Bournemouth.
" 9	Bargoed—Alterations to Hotels	Rhondda Valley Breweries Co.	Rhondda Valley Breweries Co., Pontypridd, Wales.
" 9	Walsall—Manual Instruction Centre	Education Committee	Bailey & McConnal, Architects, Bridge Street, Walsall.
" 9	Bodmin—Grand Stand	Company	M. Oliver, Architect, Bodmin.
" 10	Llanteglos-by-Powey—Shelter	Education Committee	A. Isbell, 2 Esplanade Terrace, Fowey.
" 10	Thornhill—Rebuilding	S. Webster & Son	Jackson & Fox, Architects, 7 Rawson Street, Halifax.
" 10	London, S.E. Sorting Office	H.M. Office of Works	J. Wager, H.M. Office of Works, Storey's Gate, Westminster, S.W.
" 10	Southampton—Roof Covering	Corporation	Borough Engineer's Office, Southampton.
" 10	Swansea—Conveniences	Corporation... ..	Borough Surveyor, 13 Somerset Place, Swansea.
" 10	Northwich—School	Education Committee	A. E. Thomas, Clerk, Education Offices, Northwich.
" 10	Blackfriars—Power Station	H.M. Office of Works	J. Wager, H.M. Office of Works, Westminster, S.W.
" 10	Twickenham—Repairs to Mansion	London County Council	Architect's Department, 15 Pall Mall East, S.W.
" 12	Southampton—Store, &c.	H.M. Office of Works	Director-General, Ordnance Survey, Southampton.
" 13	Aberdeen—Sheds, &c.	Royal Northern Agricultural Society	R. R. Ross, Secretary, Balmoral Buildings, 67-71 Green, Aberdeen.
" 16	Preston—School	Education Committee	Education Offices, Preston.
" 16	London, S.W.—Baths	Borough Council	Council House, East Hill, Wandsworth, S.W.
" 16	Croydon—Fire-station	Council	G. F. Carter, Borough Engineer, Town Hall, Croydon.
" 17	Enfield—Post-office	H.M. Office of Works	J. Wager, H.M. Office of Works, Westminster, S.W.
" 18	Hammersmith—New Baths	Council	H. Thompson, Town Clerk, Hammersmith.
" 19	Leeds—Post-office	H.M. Office of Works	H. G. Nixon, H.M. Office of Works, Infirmary Street, Leeds.
" 21	Manchester—Alterations to School	Education Committee	Education Offices, Deansgate, Manchester.
" 27	Lewes—Police Offices, &c.	County Council	F. J. Wood, County Surveyor, Lewes.
" 30	Westhorpe—Enlargement of School	Education Committee	G. W. Leighton, Architect, Princes Street, Ipsw'ch.
ENGINEERING :			
Oct. 6	Bollington—Gas-engine, &c.	Gas Committee	Gas Manager, Bollington, Cheshire.
" 9	Liege—Extension of Water Conduit	County Council	A. Halleux, C.E., 74 rue Fabry, Liege.
" 10	London—Reconstruction of Bridges	County Council	M. Fitzmaurice, Chief Engineer, County Hall, Spring Gardens, S.W.
" 10	Alexandria, Egypt—Quays	County Council	Director-General of Harbours and Lighthouses, Alexandria.
" 10	Gosport—Main-laying	Waterworks Co.	E. T. Hildred, Engineer, Waterworks Offices, Gosport.
" 16	Horsforth—Borehole Pump	Urban District Council	E. J. Silcock, M.I.C.E., 10 Park Row, Leeds.
" 16	Horsforth—Gas-engine	Urban District Council	E. J. Silcock, M.I.C.E., 10 Park Row, Leeds.
" 16	Bournemouth—Passenger Lifts	Town Council	Borough Engineer, Bournemouth.
" 23	Mussoorie, India—Electric Lighting and Waterworks Scheme.	Municipality	C. H. Shanahan, Municipal Office, Mussoorie, India.
Nov. 9	Havana—Pier... ..	—	Cuban, Consulate London.
IRON AND STEEL :			
Oct. 9	Mussoorie, India—Pipes, &c.	Municipal Board	C. H. Shanahan, Municipal Office, Mussoorie.
" 10	Southall—Fencing, &c.	Urban District Council	R. Brown, Engineer, Public Offices, Southall.
" 14	Manchester—Steel Roof, &c.	Gas Committee	C. Nickson, Superintendent, Gas Department, Manchester.
" 17	London, S.W.—Truck Rails, &c.	County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
PAINTING AND PLUMBING :			
Oct. 9	Blackrock—Painting Town Hall... ..	Urban District Council	Surveyor's Office, Town Hall, Blackrock.
" 9	Nottingham—Painting Power-station	Electricity Committee	A. Brown, City Engineer, Nottingham.
ROADS AND CARTAGE :			
Oct. 6	Cradley Heath—Road Works	Urban District Council	Council Offices, Lawrence Lane, Old Hill, Staffs.
" 6	Ulverston—Widening	Rural District Council	Surveyor of Highways (Rural District), Town Hall, Ulverston.
" 9	Bournemouth—Path	Town Council	F. W. Lacey, Borough Surveyor, Municipal Offices, Bournemouth.
" 18	Carshalton—Materials	Urban District Council	W. Willis Gale, Surveyor to the Council, Carshalton.
SANITARY :			
Oct. 6	Newmilns—Drainage Works, &c.	Town Council	H. R. Young, Town Clerk, Newmilns, Scotland.
" 9	Alnwick—Relaying Sewer... ..	Rural District Council	H. W. Walton, Clerk, Council Offices, Alnwick.
" 9	Pontypridd—Drains... ..	Urban District Council	P. R. A. Willoughby, A.M.I.C.E., Council Offices, Pontypridd.
" 9	Long Ashton—Sewerage Works... ..	Rural District Council	A. P. I. Cotterell, Engineer, 28 Baldwin Street, Bristol.
" 9	Waterloo—Drainage Works	Rural District Council	G. C. Vernon-Inkpen, Surveyor, 40 Commercial Road, Portsmouth.
" 10	Southampton—Sewers	Corporation	Borough Engineer's Office, Southampton.
" 10	Thorne—Scavenging	Rural District Council	J. Stanley, Surveyor, The Green, Thorne.
TIMBER :			
Oct. 10	London, W.—Timber	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, W.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Oct. 9	London—Shop Fronts	£75	—	W. H. Smith & Sons, 186 Strand, W.C.
" 16	Preston—School	£50, £30 and £20	—	Director of Education, Education Offices, Preston.
" 20	Bridlington—Concert Hall	35 and 20 guineas	—	A. E. Mathewman, Town Clerk, Bridlington.
Nov. 4	Maesteg—Chapel	—	—	W. Job, Llynir Lodge, Maesteg, Wales.
" 4	Greenwich—Library	£25, £15, £10	—	F. Robinson, Town Clerk, Greenwich.

a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

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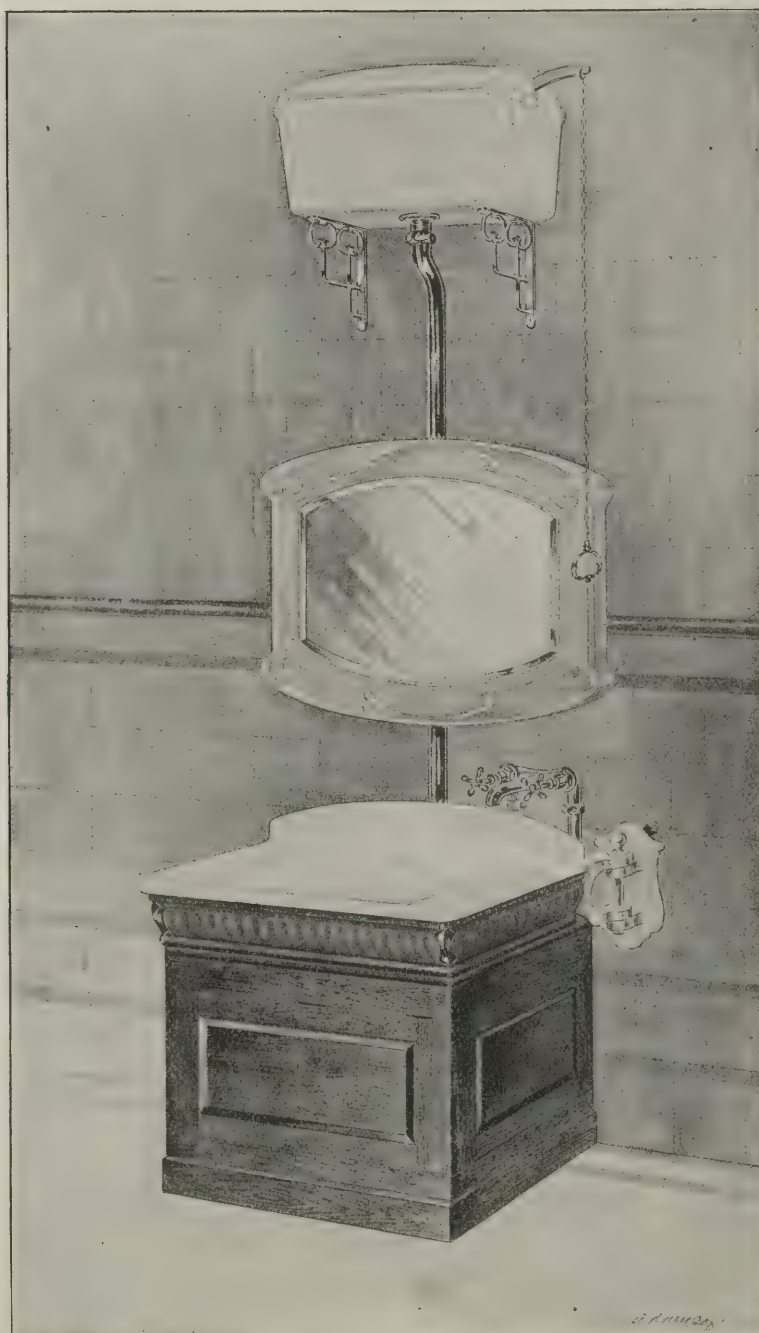
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Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aylesbury.—For the erection of Aylesbury Council school, for the Education Committee:—

R. Cleaver, Northampton...	£11,737	0	0
C. W. Cox & Son, Maidenhead...	10,877	12	0
J. E. Johnson & Son, Leicester...	10,870	0	0
Oak Building Co., Cambridge...	10,868	0	0
J. Barker & Co., Kensington, S.W.	10,787	0	0
S. E. Moss & Co., Southend-on-Sea	10,764	0	0
Benfield & Loxley, Oxford	10,729	0	0
G. & F. Cannon, Aylesbury and			
Bierton	10,678	0	0
J. Appleby & Sons, Lambeth, S.E.	10,660	0	0
F. G. Minter, Putney, S.W.	10,533	0	0
S. Orchard & Son, Banbury	10,500	0	0
Martin, Wells & Co., Vauxhall, S.E.	10,470	0	0
W. T. Bloxham, Banbury	10,308	0	0
S. Mayne & Son, Aylesbury	10,200	0	0
J. Parren & Son, Earith	10,104	10	0
H. D. Bowyer, Slough	10,100	0	0
T. Stimson & Sons, Wokingham	10,047	9	7
R. Elvy, Southend-on-Sea	10,047	0	0
W. Lawrence & Son, Waltham			
Cross	9,940	0	0
G. Henson & Son, Wellingborough	9,925	0	0
J. Mead, Chesham	9,874	0	0
C. H. Hunt, High Wycombe	9,767	0	0
G. Darlington, Amersham	9,740	0	0
Webster & Cannon, Aylesbury	9,668	0	0
W. Corah & Son, Loughborough	9,660	0	0
Kettering Co-operative Builders	9,603	0	0
G. H. Gibson, High Wycombe	9,484	0	0
G. J. Fisher, Northampton	9,300	0	0
S. L. Gist, Abbey Road, Enfield	9,200	0	0
R. Jewell & Co., Aylesbury†	7,585	9	0

* Accepted subject to a proper agreement and bond being entered into and the necessary loan being approved by the county council in November and sanctioned by the Local Government Board. † Withdrawn.

Barry.—For the erection of proposed Masonic hall, Barry. Mr. J. A. Owen, architect, Main Street, Cadoxton, Barry:—

W. Williams, Cardiff	£3,660	0	0
J. Prout, Barry Dock	3,390	0	0
H. Fisher, Barry Dock	3,282	16	2
W. Britton, Barry Dock	3,125	0	0
Lloyd & Tape, Barry Dock	3,107	10	0
H. S. Rendell, Barry Dock	3,059	0	0
F. Bond, Leckwith, Cardiff	2,985	0	0
G. Rutter, Barry	2,950	0	0
W. T. Morgan, Fair Oak Road, Cardiff	2,906	0	0

* Accepted.

Chepping Wycombe.—For the erection of the proposed secondary school for girls, for the Town Council. Mr. A. T. Greenwood, architect, Merchant Buildings, Market Street, Manchester:—

J. Stevens & Son, High Wycombe	£4,218	0	0
J. Barker & Co., Kensington	3,973	0	0
W. J. Bloxham, Banbury	3,940	0	0
H. D. Bowyer, Slough	3,705	0	0
J. Christie, London, W.	3,690	0	0
East & Hyde, Binfield, Berks	3,655	0	0
Y. J. Lovell, Great Marlow	3,630	0	0
W. T. Toogood & Co., Reading	3,594	0	0
G. Darlington, Amersham	3,590	0	0
C. H. Hunt & Son, High Wycombe	3,573	0	0
G. Biggs & Son, Great Kingshill	3,555	0	0
H. Harris, Great Marlow	3,475	0	0
A. J. Colborne, Swindon	3,399	0	0
G. Henson & Son, Wellingborough	3,328	16	0
Kettering Co-operative Builders	3,298	0	5
G. H. Gibson, High Wycombe	3,284	0	0
J. T. Harris, High Wycombe	3,229	0	0
Ennes Brothers, Erith	3,177	0	0

Cottingham.—For the erection of a residence, for Mr. R. Kitching. Mr. T. Brownlow Thompson, architect, 15,

Parliament Street, Hull. Quantities by Mr. W. Hoffman Wood, Park Square, Leeds:—

Marsden & Son	£1,600	0	0
G. W. Richardson	1,592	0	0
J. Wilson	1,585	0	0
G. H. Pantou	1,575	0	0
E. Good & Son	1,557	10	0
Hockney & Liggins	1,549	0	0
Pape & Son	1,546	0	0
J. Thompson & Son	1,543	17	9
M. Harper	1,543	14	0
Amalgamated Builders	1,540	0	0
J. T. Levitt	1,520	0	0
Bowman & Son	1,496	0	0
Southeons' Executors	1,480	10	0
J. Houlton & Son	1,480	0	0
G. W. Berridge	1,471	7	0
H. T. Arnott	1,470	17	0
F. Bilton	1,456	0	0
H. Hunt	1,455	17	3
G. Houlton	1,450	0	0
W. Turner	1,446	10	0
J. L. Windass	1,416	13	0
J. H. Wright	1,415	13	9
T. Goates	1,393	0	0
Hill & Stephenson	1,377	2	5
J. R. Woods	1,372	1	0
H. Kaye	1,367	0	0
J. Carr & others, Hull	1,055	18	4

* Accepted.

Croydon.—For the erection of four shops, &c., for Mr. E. Clare. Mr. S. C. Hart, architect, 22, Philpot Lane, London, E.C.:—

Cordell & Sons, Clapton	£2,777		
H. E. Buckingham, Ltd., Wimbledon	2,100		
Hall & Jacobs, Sydenham	2,035		
W. Roberts, Croydon	2,000		
C. H. Wallis & Co., Fulham	1,950		
W. Brooks & Co., Croydon	1,745		
G. Buxton, Wimbledon	1,470		
M. Wallis, Ponders End	1,467		

Grays.—For the erection of a convent school, for the Rev. Mother, La Sainte Union des Sacres Cœurs, Mr. C. M. Shiner, architect, London and Grays:—

Gray & Co.	£1,850		
J. Brown	1,810		
G. Brown	1,695		
Dobson & Davidson	1,677		
H. J. Carter*	1,690		

* Accepted.

Grays.—For additions to Bridge Road schools and the erection of a manual and cookery block, for the Essex Education Committee. Mr. C. M. Shiner, architect, London and Grays:—

Hawkey & Oldham	£7,095	0	0
H. Butcher	5,679	12	7
H. C. Horswill	5,500	0	0
H. H. Carter	5,436	0	0
G. Brown	5,353	10	0
W. Potter	5,220	15	6
F. & E. Davy	5,094	0	0
T. Bruy	5,017	16	0
Haydon & Sons	4,951	6	0
J. Brown	4,888	0	0
Hammond & Son	4,796	0	0
W. H. Archer	4,788	0	0
S. E. Moss	4,590	0	0
H. T. Carter*	4,488	0	0

* Accepted.

Ipswich.—For the erection of new nurses' quarters at the Fever Hospital, for the Corporation. Mr. E. Buckham, borough surveyor:—

R. Girling	£1,695		
W. Grayston	1,677		
H. J. Linzell	1,649		
C. Borrett	1,597		
C. A. Green	1,593		
W. H. Death	1,589		
G. Grimwood & Sons	1,583		
S. Skerritt	1,560		
J. C. Smith	1,450		
S. A. Kenney* Burrell Street, Ipswich	1,375		

* Accepted.

Ipswich.—For the erection of school in Clifford Road, for the Council. Messrs. Eade & Johns, architects, Cornhill Chambers, Thoro'fare, Ipswich:—

James & Gover	£15,273	0	0
C. A. Green	13,590	0	0

The Oak Building Co.	£13,400	0	0
A. Sadler	13,255	0	0
G. Grimwood & Sons	13,213	0	0
T. H. Blyth	13,085	9	6
T. Parkinson & Sons	13,000	0	0
R. Girling	12,979	0	0
J. Mackay	12,698	0	0
H. J. Linzell	12,558	0	0
E. Catchpole & Sons	12,464	0	0
Spencer, Santo & Co.	12,100	0	0
F. C. Thurman	11,999	19	9
A. G. Beckett	11,950	0	0
S. A. Kenney*	11,675	0	0
Clark & Sons	11,600	0	0
W. H. Maxey & Son	11,443	0	0
W. Manders	11,431	14	1

* Accepted.

Lingfield.—For alterations and additions to Lingfield Council school, for the Education Committee. Messrs. Jarvis & Richards, architects:—

W. Harman	£5,615	3	0
F. F. Foster	4,998	0	0
W. H. Hyde	4,740	0	0
G. Wade	4,598	0	0
W. T. Toogood & Co.	4,511	0	0
Cropley & Sons	4,520	7	6
Baldwin & Stanford	4,518	1	5
J. Quintenton	4,499	14	6
J. Barker & Co.	4,435	0	0
I. Waters & Sons	4,278	11	0
W. Roberts	4,249	12	4
R. Elvy	4,202	0	0
J. J. Pink	4,191	5	0
Drowley & Co.	4,054	12	1
Martin, Wells & Co.	4,010	0	0
East & Hyde	3,950	0	0
S. E. Moss & Co.	3,862	10	0

London, E.—For alterations and additions to St. Bonaventure's Grammar Schools, Khedive Road, Forest Gate, for the Rev. A. Darvell. Mr. C. M. Shiner, architect, London and Grays:—

W. Potter	£3,025	0	0
Godson & Son	2,789	0	0
Calnan & Son	2,635	0	0
Maddison	2,591	0	0
Harris	2,568	0	0
Hammond & Son	2,491	0	0
H. C. Horswill	2,489	0	0
G. Brown	2,383	0	0
Gray & Co.*	2,333	17	6

* Accepted.

London, N.W.—For the erection of a new sorting office at Cricklewood, for H.M. Office of Works, &c.:—

J. Allen & Sons	£2,745	0	0
C. Ansell	2,662	0	0
J. T. Robey	2,577	0	0
E. Laurance & Sons	2,397	0	0
R. Dean & Co.	2,364	10	0
Martin, Wells & Co.	2,340	0	0
Speechley & Smith	2,330	0	0
Edwards & Medway	2,330	0	0
Aldridge & Son	2,300	0	0
G. Wiggs	2,300	0	0
Galbraith Brothers	2,243	0	0
R. Elvy	2,215	0	0
Pollard & Brand	2,200	0	0
Gathercole Brothers	2,200	0	0
B. E. Nightingale	2,190	0	0

Sheffield.—Accepted for the erection of seventy dwellings in Edmund Road and Clough Road, in connection with the rehusing scheme. Mr. Charles F. Wike, M.I.C.E., city engineer:—

Excavator, bricklayer and mason.			
Wellerman Brothers, Hyde	£7,836	0	0
Carpenter and joiner.			
T. Roper & Son, Sheffield	2,855	5	8
Plumber and glazier.			
Hull & Son, Nottingham	698	0	0
Plasterer.			
T. Roper & Son, Sheffield	770	0	0
Slater.			
Dewber, Townsley & Co., Hull	641	16	0
Painter.			
A. Machin, Sheffield	202	19	9

(Continued on p. xvi.)

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ARCHITECT'S ASSISTANT (24) disengaged; nine years' experience; good draughtsman, designs, working drawings, details, &c.; London or country.—W. H. L., 83, Elspeth Road, Clapham Common, S.W. 1374

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PLASTERER wants WORK; day or piece or charge. Good references; 15 years' experience.—Box 1403, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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See p. xx for the Employment Register.

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The INTERMEDIATE EXAMINATION on the 7th, 8th, 9th, and 10th NOVEMBER, 1905.
Applications must be sent in on or before the 7th OCTOBER.

The FINAL and SPECIAL EXAMINATIONS from the 17th to the 24th NOVEMBER, 1905 (inclusive).
Applications must be sent in on or before the 21st OCTOBER.

The Testimonies of Study, etc., with the necessary fees, should accompany the applications, all of which are to be addressed to the undersigned.

W. J. LOCKE,

Secretary, R.I.B.A.

No. 9, Conduit Street, London, W.

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October 6th., Ordinary General Meeting at No. 18, Tufton Street, Westminster, S.W., at 7.30 p.m. Address by the President, Mr. E. GUY DAWBER, F.R.I.B.A., and distribution of Prizes and Medals.

Exhibition of students' work, prize and other drawings.

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The Day and Evening Schools are now in progress. Entending Pupils should forward their names to the Secretary as early as possible.

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The Directors of the Metropolitan Railway Company are prepared to receive TENDERS for the SUPPLY of GENERAL STORES during twelve months ending 31st October, 1906.

Manufacturers and others desirous of Tendering should apply to the undersigned on or after the 26th SEPTEMBER, 1905, for a form or forms under the following numbers:—

No.

4. Bolts, nuts, rivets, spikes, washers, iron fencing, &c.

8. Carriage handles, hinges, locks, &c.

11. Cement, bricks, pipes, paving, slates, broken granite, &c.

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28. Handles—hammer, &c., coupling poles, ladders, scaffolding, barrows, &c.

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41. Pipes—iron socket and rainwater—ra ges, &c.

42. Sand, gravel, and picked flints.

46. Timber—eals, creosoted, telegraph poles, jarrah, sawdust, &c.

47. Timber—teak, mahogany, oak, ash, telegraph arms, &c.

After the forms have been obtained, samples and patterns of articles and goods may be seen at the Office of the COMPANY'S STOREKEEPER adjoining Neasden Station, N.W., from MONDAY, OCTOBER 2nd, to SATURDAY, OCTOBER 7th, both days inclusive.

Tenders on the forms supplied by the Company only, and endorsed "Tender for ——" must reach the SECRETARY not later than TEN a.m., on MONDAY, OCTOBER 9th.

The Directors do not bind themselves to accept the lowest or any Tender.

R. H. SELBIE, Secretary.

Secretary's Office, 32, Westbourne Terrace, London, W.

EAST SUSSEX COUNTY COUNCIL. TO BUILDERS.

TENDERS are invited for the ERECTION of new POLICE OFFICES and SUPERINTENDENTS' HOUSES and ALTERATIONS to the existing BUILDINGS at Lewes, for the East Sussex County Council.

Plans, specification, and conditions of Contract may be seen, and bills of quantities obtained, after FRIDAY, 6th October next, on application to Mr. F. J. WOOD, County Surveyor, Lewes, between the hours of TEN a.m. and FOUR p.m. (Saturdays Ten a.m. and One p.m.), on payment of a deposit of three guineas, which deposit will be returned upon the receipt of a bona-fide Tender.

The contractor whose Tender is accepted will be required to enter into a Contract with the County Council and, if required, enter into a bond with two approved sureties for the due carrying out of the Contract.

Tenders, endorsed "Tender for New Police Offices and Superintendents' Houses," to be addressed and delivered to the undersigned at the County Hall, Lewes, not later than TEN a.m. on FRIDAY, 27th OCTOBER, 1905.

The County Council does not bind itself to accept the lowest or any Tender, and will not pay any expenses in connection with the preparation thereof.

F. MERRIFIELD,

Clerk of the County Council.

County Hall, Lewes,
12th September, 1905.

£750 claim paid.

The following list is interesting, as it gives particulars of some of the claims that have been paid under the BUILDERS' JOURNAL Insurance Schemes. The ease with which an accident happens, and the heavy expense often incurred by doctors' bills and loss of occupation are subjects that every thoughtful man has to consider, and there could not be a better method of protection than such Insurance policies:

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Architect.—Slipped on floor, and in falling struck arm of chair. £1.

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TENDERS—cont. from p. xiii.

Reigate.—For the erection of house, &c., Pilgrim's Way, for Mr. E. Poland. Mr. C. E. Salmon, architect, Bell Street, Reigate:—

G. Martin	...	£2,580
C. Nightingale & Sons	...	2,419
W. Bagaley & Sons	...	2,350
J. King & Son*	...	2,185

* Accepted.

Sheffield.—For alterations and additions to Wesley College buildings to adapt them for use to King Edward VII. School, for the Education Committee. Messrs. Gibbs & Flockton, architects, 15, St. James's Row, Sheffield:—

Armitage & Hodgson	...	£23,660	0	0
D. Gill & Son	...	23,381	0	0
H. Brumby & Son	...	21,700	0	0
W. & A. Forsdike	...	21,530	0	0
J. Eshelby & Son	...	21,350	0	0
G. Carr	...	21,200	0	0
J. T. Wright	...	21,200	0	0
D. O'Neill & Son	...	21,150	0	0
T. Wilkinson & Sons	...	20,980	0	0
T. Roper & Sons	...	20,877	0	0
J. Fidler	...	20,827	0	0
J. Vasey & Son	...	20,710	0	9
G. Longden & Son	...	20,531	14	11
J. Mastin & Son	...	20,500	0	0
H. Boot & Son	...	20,000	0	0
T. Lowe & Sons	...	19,985	0	0
Ash, Son & Biggin	...	19,860	0	0
Dawson, Jones & Co.,* Sheffield	...	19,298	15	0

* Accepted.

Southampton.—For the erection of artisans' cottages on the Sommel Street area, for the Corporation. Mr. C. J. Hair, architect, 23, Portland Street, Southampton:—

Brown & Son, Bournemouth	...	£3,399	0	0
H. J. Hood, Suffolk Avenue, Freemantle	...	3,298	0	0
Jenkins & Sons, Southampton	...	3,204	0	0
J. R. Long, Shirley, Southampton	...	3,174	15	0
J. Nicol,* Bitterne Park, Southampton	...	3,099	0	0

[Architect's protecting tender, £3,276 6s. 5d.]

* Accepted.

Stockport.—For the erection of the new union offices at Shaw Heath, for the Guardians. Mr. W. H. Ward, architect, Paradise Street, Birmingham:—

R. Neill & Sons, Manchester	...	£8,570	0	0
T. Cuthbert, Nottingham	...	8,454	16	8
W. Brown & Sons, Salford	...	8,250	0	0
J. Gerrard & Sons, Manchester	...	8,130	0	0
Young, Tinker & Young, Manchester	...	7,995	0	0
S. Robinson & Sons, Hyde	...	7,990	0	0
T. Hoe	...	7,888	0	0
W. Pownall	...	7,598	16	1
W. C. Broadhurst	...	7,560	0	0
J. Briggs	...	7,481	0	0
D. Eadie*	...	7,456	0	0
G. Longden & Son, Sheffield	...	7,450	0	0
T. & W. Meadows	...	7,510	0	0
Burgess & Galt, Manchester	...	7,454	0	0

* Accepted.

[Rest of Stockport.]

Witton Gilbert.—For the works required to be done in execution of proposed alterations and additions to the "Traveller's Rest" Inn, Witton Gilbert, for Mr. George Hobson. Mr. John J. Eltringham, architect:—

Craig Brothers	...	£1,190	4	8
W. Ayton & Sons	...	1,177	2	6
T. Gallacher,* Gallacher Terrace, Blackhill, Durham	...	1,086	10	0

* Accepted.

Woking.—For the erection of a new school at Maybury, Woking, for the Education Committee. Messrs. Jarvis & Richards, architects:—

F. Aylott	...	£6,966	16	9
J. Barker & Co.	...	6,818	0	0
Toogood & Co.	...	6,745	3	7
T. Stimson	...	6,566	4	4
G. Kemp	...	6,459	0	0
Martin, Wells & Co.	...	6,450	0	0
J. Hart	...	6,350	2	8
East & Hyde	...	6,329	0	0
McC. E. Pitt	...	6,249	0	0
Higgs & Outhwaite	...	6,195	0	0
E. C. Hughes	...	6,158	0	0
Drowley & Co.	...	6,077	6	4
R. Elvy	...	5,996	0	0
T. J. Hawkins	...	5,885	0	0
S. E. Moss & Co.	...	5,702	0	0

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Beans	per qr.	1	10	0	1	12	0
Clover, best	per load	3	12	0	4	0	0
Hay, good	do.	3	3	0	3	10	0
Sainfoin mixture	do.	3	7	0	3	15	0
Straw	do.	1	10	0	1	18	0

OILS AND PAINTS.

Castor Oil, French	per cwt.	1	3	11	1	6	3
Colza Oil, English	do.	1	2	9	—	—	—
Copperas	per ton	2	0	0	—	—	—
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0	—	—	—
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels	per cwt.	0	16	3	—	—	—
Petroleum, American	per gal.	0	0	5½	0	0	6
Do. Russian	do.	0	0	5½	—	—	—
Pitch	per barrel	0	8	0	—	—	—
Shellac, orange	per cwt.	9	0	0	—	—	—
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0	1	5	3
Tar, Stockholm	per barrel	1	5	0	—	—	—
Turpentine	per cwt.	2	8	6	—	—	—

METALS.

Copper, sheet, strong	per ton	84	0	0	—	—	—
Iron, Staffs, bar	do.	6	2	6	8	0	0
Do. Galvanized Corrugated sheet	do.	11	10	0	11	15	0
Lead, pig, Soft Foreign	do.	14	2	6	14	3	9
Do. do. English common brands	do.	14	7	6	14	10	0
Do. sheet English, 3lb. per sq. ft. and upwards	do.	15	0	0	—	—	—
Do. pipe	do.	16	0	0	—	—	—
Nails, cut clasp, 3in. to 6in.	do.	9	5	0	—	—	—
Do. floor brads	do.	9	0	0	—	—	—
Steel, Staffs, Girders and Angles	do.	5	7	6	5	12	6
Do. do. Mild bars	do.	6	0	0	6	5	0
Tin, Foreign	do.	146	15	0	147	5	0
Do. English ingots	do.	148	5	0	148	15	0
Zinc, sheets, Silesian	do.	20	10	6	—	—	—
Do. do. Vienne Montaigne	do.	20	12	6	—	—	—
Do. Spelter	do.	27	5	0	27	10	0

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Fir, Dantzic and Memel	per load	2	12	6	5	0	0
Pine, Quebec, Yellow	do.	4	0	0	7	10	0
Do. Pitch, American	do.	3	3	0	5	0	0
Laths, log, Dantzic	per cu. fath.	4	0	0	6	0	0
Deals, Oxelosund, Yellow, 2nd, 4 x 11	per std.	8	15	0	—	—	—
Do. do. do. 3 x 7	do.	8	10	0	—	—	—
Do. Mariehill, Yellow, 5th, 4 x 9	do.	7	15	0	—	—	—
Do. Montreal, Bright Pine, 1st, 3 x 11	do.	23	10	0	—	—	—
Do. Quebec, Dry Pine, 1st, 3 x 11	do.	23	15	0	—	—	—
Do. do. Bright Pine, 5th, 3 x 11	do.	7	15	0	—	—	—
Do. do. Spruce, Unsorted, 3 x 11	do.	8	15	0	—	—	—
Do. do. do. 3 x 10	do.	8	10	0	—	—	—
Do. do. do. 3rd, 3 x 9	do.	9	0	0	—	—	—
Do. Three Rivers, Yellow Pine, 4th, 3 x 11	do.	9	0	0	—	—	—
Do. Nederkalix, Yellow, 3rd, 3 x 4½	do.	7	0	0	—	—	—
Do. Gothenburg, Yellow, 2½ x 7	do.	8	10	0	—	—	—
Battens, all kinds	do.	6	15	0	13	0	0
Flooring Boards in. prepared, 1st...	per square	0	9	9	0	10	9
Do. 2nd	do.	0	8	6	0	10	0
Do. 3rd, &c.	do.	0	8	9	0	9	6

HARD WOODS.

Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick	do.	2	0	0	4	5	0
Do. Quebec do.	do.	2	5	0	4	10	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	3½	0	0	4
Do. Honduras	do.	0	0	3½	0	0	4
Do. Tobasco	do.	0	0	5	—	—	—
Whitewood, American, logs	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Elm, Quebec	per load	4	5	0	8	10	0
Jarrah, plank	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	5½	—	—	—
Do. Tobasco	do.	0	0	3½	0	0	6

The Parish Church of Skegby, Notts, now undergoing extensive restoration, has been ruined by the workings of a local-coal mine. The pit workings pass underneath the church at a depth of 400ft. to 500ft., and the settlement of the ground has caused the tower and body of the church to subside, the former to the extent of 6ins. After the subsidence great cracks were noticed in the tower, but the north aisle has fared the worst. The stonework of the piers has been so much disturbed that iron bands have to be used to keep it in position, whilst stout wooden beams are introduced to support the roof.

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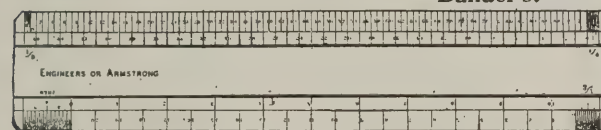
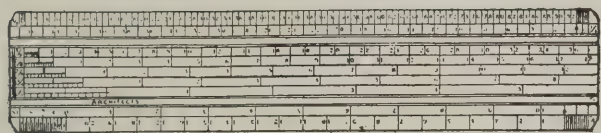
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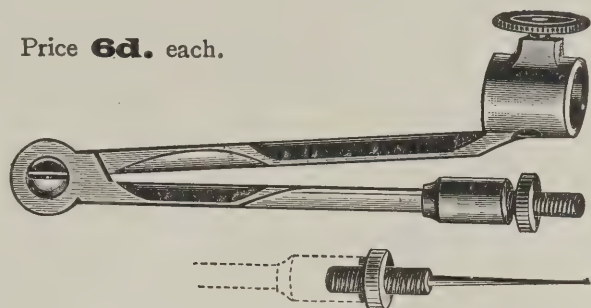


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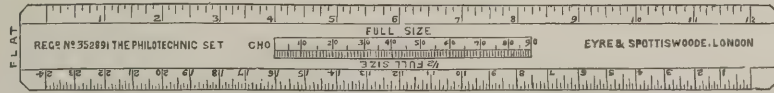
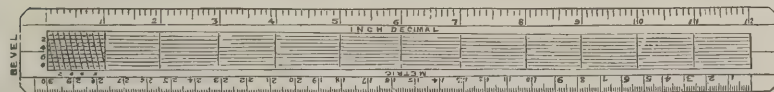
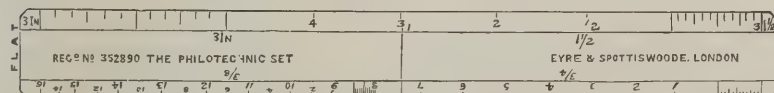
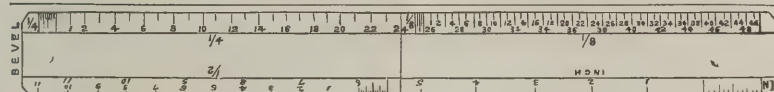
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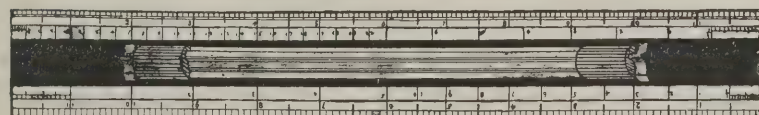
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[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending September 29th thirty failures in the building and timber trades in England and Wales were gazetted.

T. NIXON, builder, London E.C. R.O. Sept. 20th.
E. CANE, contractor, Brighton. Adj. Sept. 21st.
H. BOOT, plumber, Aston: R.O. Sept. 18th.
C. JACKSON, painter, Scarborough. R.O. Sept. 22nd.
E. L. WILLIAMS, builder and contractor, Rhyl. P.E., Magistrates' Room, Bangor, Oct. 5th, at 12.30.
J. WELHAM, builder and contractor, Lowestoft. Liabilities £2,026; deficiency £1,775.
BLACKELL & SON, builders, Plymouth. Liabilities £6,798; assets £999.
E. S. NICHOLAS, architect and civil engineer, Chesterfield. Adjudged P.E., Chesterfield C.C., Oct. 20th, at 2.
W. E. CAPON, builder and contractor, Manningtree. P.E., Colchester Law Courts, Oct. 13th, at 11.30.
S. CUTLER, painter and decorator, &c., Bournemouth. Adj. Sept. 18th.
H. EVANS & SON, builders and decorators, St. Albans. P.E., St. Albans C.C., Oct. 31st, at 10.30.
G. SWINNERTON, builder and contractor, Liverpool. Adj. Sept. 18th.
J. R. ROBSON, brick manufacturer, Blyth (late Hebburn). P.E., Newcastle-on-Tyne C.C., Oct. 19th, at 11.
T. HICKTON, journeyman mason, Nottingham. P.E., Nottingham C.C., Oct. 18th, at 10.
F. C. WALLWORTH, builder, Tunstall. P.E., Hanley Town Hall, Oct. 24th, at 11.
J. WILLIAMS, builder and contractor, Swindon. R.O. Sept. 22nd.
J. J. MULLETT, builder and contractor, Dudley. Adj. Sept. 21st.
J. W. BARKER, painter and paperhanger, Hull. P.E., Hull C.C., Oct. 23rd, at 2.
W. BINNS, contractor, Bradford. First meeting, O.R.'s, Bradford, Oct. 10th, at 3. P.E., Bradford C.C., Oct. 25th, at 10.
A. GELDARD, builder, Leeds. First meeting, O.R.'s, Leeds, Oct. 5th, at 12. P.E., Leeds C.C., Oct. 16th, at 11.
P. HOLMES, plumber and decorator, Dover. First meeting, O.R.'s, Canterbury, Oct. 5th, at 10. P.E., Canterbury Guildhall, same day, at 12.

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Coming Events.

Wednesday, October 4.

KING'S COLLEGE, LONDON.—Course of Training for Sanitary Inspectors in Building Construction commences.

INSTITUTE OF SANITARY ENGINEERS.—Mr. A. A. Kemp on "Estate Development," at 7 p.m.

Friday, October 6.

ARCHITECTURAL ASSOCIATION.—Annual General Meeting, President's Address and Distribution of Prizes, 7.30 p.m.

GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Presidential Address on "Nature the Architect," at 8 p.m.

Saturday, October 7.

ROYAL SANITARY INSTITUTE.—Provincial Sessional

Meeting at the Guildhall, York, at 11 a.m. Discussion on "Pure Milk Supply."

Tuesday, October 10.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Harben Lecture by Prof. T. Oliver, at 5 p.m.

Thursday, October 12.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Harben Lecture by Prof. T. Oliver, at 5 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Visit to Chelsea Electricity Generating Station.

CARPENTERS' COMPANY.—Prof. D. S. Capper, of King's College, on "Sites: Wet and Dry Foundations," &c., Carpenters' Hall, London Wall, at 7.30 p.m.

Friday, October 13.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Annual Dinner in Newcastle.

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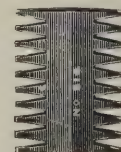
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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

October 11, 1905. Vol. 22, No. 557.

6, Great New Street, Fetter Lane, E.C.

Summary.

In his presidential address to the Architectural Association on Friday evening Mr. E. Guy Dawber announced that the donor of the £1,000 to the new premises fund was Mrs. Arthur Cates. Speaking of the syllabus formulated by the Board of Architectural Education, he said it would doubtless be adopted by all the recognized institutions throughout the country, and he regarded it as by far the most important step towards the advancement of architectural education that had ever been taken. The day school was making admirable progress, and was being attended by students not only from this country but by those from the colonies who came over here. Speaking of the public taste in architecture, he said that the general lack of appreciation in this country was not due to apathy or indifference, but simply to want of knowledge, and he commended the idea of the architect signing his building as being in no way derogatory to his calling any more than in the case of the painter and sculptor. (Page 204.)

A fraudulent practice exists in marking Belgian cement as "Best Portland," and selling it as such at undercutting prices. Much of it is natural cement, and does not go through the same process as the English, and in that respect is inferior. (Page 209.)

A lay critic of the Garden City describes it as a series of hen scratchings and a few advertisement places for jerry-builders; a place where all the moonstruck architectural ideas of the island seem to have been let loose. (Page 210.)

The Electrical Exhibition at Olympia offers many exhibits of interest to architects and builders. Electric motors for haulage and hoisting are shown, and numerous electric-light fittings, new lamps, radiators, fire alarms, ventilating fans, lifts, telephones, &c., are included. (Page 213.)

Mr. Perkins Pick delivered an address at Leicester last week on the decline of artistic handicraft. In all probability, he said, it was impossible to give that human interest to machine-made articles which the old handicraft goods possessed, but there was not a doubt that men of good taste could enormously improve upon the work generally produced if their services were requisitioned by those who had the power to direct the process of manufacture, for machine-made articles were not necessarily ugly. (Page 208.)

No successors to Mr. Alfred Gilbert and Mr. George Aitchison as Academy professors of sculpture and architecture respectively have yet been appointed. (Page 212.)

300 mistakes have been found in 29 contract drawings of the new Colsterdale reservoir for Leeds. One result is that the corporation have had to acquire fifty additional acres from Lord Masham. (Page 212.)

Battlements. ONE of the absurdities of modern design is the profusion of battlements, included on every possible occasion by architects who think they have a feeling for mediæval work. On the tops of porches and of bay windows and along the skylines of buildings these excrescences frown down upon us, suggestive of the time when bows and arrows were weapons. Upon modern villas, turrets are constructed sometimes with long slits for the absent archers: and one can think their only use might be as a haven where the hard-pressed tenant could retreat in dire necessity from the besieging tax collector. If the architect must decorate his skyline with a fringe, let him have resort to the decorative battlements such as we find in Venetian and Veronese work, or a modification of the Gothic cresting. These offer plenty of suggestion for pleasing modern treatment. Many of the old battlements in the mediæval towns of Italy are of brick, a peculiar type being the Scaliger or La Scala battlement. A common form in Moslem architecture is the Almena, in which a stepped slope has the uprights of the steps cut to a backward or reverse slope. This is often very picturesque, but let architects shun the copying of forms which were produced by circumstances quite different to the present; and let the fortified battlement be relegated to limbo with the split pediment and the blocked column.

After the Architect the Client. WE suppose that every architect who has been in practice for some years has had the experience of seeing considerable alterations made to his building after the client has obtained possession—not constructional alterations so much as the addition of features (perhaps small in themselves) which have a most disastrous effect on the general appearance of the building. Architects who do domestic work will recall how the interiors, on the design of which they spent so much care, have been absolutely spoiled by the introduction of commonplace furniture altogether at variance with the rest of the room. So much is this the case that we very rarely see a room where the client's taste has not been more or less unfortunate. There is a story of the late Mr. William Butterfield, who, on paying a visit to a house in the country which he had designed, found the walls overgrown with creeper, which, however generous a mask it may be for the productions of some men, was hardly desirable in the case of Butterfield, whose detail in mouldings and surface decoration was so interesting. Butterfield on this occasion had

the offending creeper cut down without asking his client's permission. We can hardly suppose that a similar procedure is likely to be within the power of ordinary architects, nor would it be desirable, and the idea of an architect having the whole of a room cleared of tasteless furniture is of course ludicrous. Nevertheless it is most disappointing when rooms are thus marred, so absolutely destroying the architectural work. We know of a case of a hospital in London to which the architect gave the greatest care, producing a most delightful building, but the trustees, when it came into their possession, quietly introduced the friendly carpenter to fit up certain woodwork in recesses in the nurses' bedrooms, and here the familiar scriggly stuff, well-varnished, made its appearance. On a larger scale we now have two instances of similar misapplication of energy, namely, the Waldorf Theatre and the new Gaiety Hotel. Everyone in London knows these buildings, and there is no occasion whatever for the former to be bespattered with large gilt letters nor for the latter to have illuminated signs and lamps spread all about it. In both cases the disfigurement is considerable and quite needless.

The Porch as a Place for Recreation. MR. GOTCH is especially interesting when describing the development of the English house of to-day. He shows so lucidly how the large passage hall was gradually restricted until the hall vanished and the passage alone remained as a communication between rooms. How comes it, then, that he should have forgotten the possibilities of the porch? In this country we are dull-witted enough to think of this only as a little place of protection against the weather, and we are once more indebted to the land across the sea for a more expansive outlook. For thus one of our American contemporaries: "The majority of people who are erecting new residences want a large porch where they can spend their afternoons and evenings in comfort. It not only makes the home more attractive but it is beneficial to the health of the occupants, as the air on the porch is purer and more refreshing than in the house. A suggestion well worth considering by those who expect to build is to have the porch extend around to the side of the house. This will prevent any inconvenience to those who wish to enter the front door when there are a number of people seated on the porch. The chairs should all be comfortable, with large arms, as the porch is strictly a place for recreation."

THE ARCHITECTURAL ASSOCIATION.

New Session Begins: President's Address.

ON Friday evening at 18, Tufton Street, Westminster, the fifty-ninth session of the Architectural Association was opened, the chair being occupied by the president, Mr. E. Guy Dawber, F.R.I.B.A.

Mr. J. J. Burnet was elected a member of the Association, Mr. Dawber observing that with one exception all the members of council of the Institute were now members of the Association and the one exception was a member some time ago. Mr. F. H. Atkinson and Mr. H. S. Sawyer were also elected members, after which it was announced that Messrs. P. L. Forbes, R. G. Elwes, A. C. R. Mackenzie and W. E. Monro had been reinstated. The prizes, medals, &c., for the past session were then distributed.

The president then delivered his address. After acknowledging their thanks to the retiring hon. secretary, Mr. Louis Ambler, and to Mr. Francis Hooper, hon. treasurer, who was retiring from the editorship of "A.A. Notes," Mr. Dawber expressed the satisfaction which all felt that their burden of debt was being rapidly cleared away, so that in a short time the Association might look forward to being free from any pecuniary liabilities. The total cost in connection with the new premises had been £10,240.

The Donor of the £1,000.

A generous friend had made an offer of £1,000, provided their debt was cleared off by the end of last session, and although it was found impossible to do that, he was able to announce at their annual dinner in May that this conditional offer had been converted into a gift, and it gave him further pleasure to state now that they had received this £1,000 and that their generous friend was Mrs. Arthur Cates.

In addition to this, since last October they had had promised and actually collected no less than £1,962, including a grant of £527 from their general fund, reducing their indebtedness at the present time to the comparatively small amount of £1,019; and no one would be more gratified with this than Mr. W. Howard Seth-Smith, to whose initiative the scheme was very largely due.

The president then proceeded to refer to the deaths of members during the past year, mentioning Mr. Thomas Blashill and Mr. John Norton, who, with Mr. C. B. Arding (their oldest member) and Mr. C. Forster Hayward, had belonged to the Association for upwards of half a century; Mr. Alfred Waterhouse, who had been a member since 1866; Mr. John Leaning, their former lecturer on quantity surveying; Mr. J. K. Collings, once hon. secretary of the Association; Mr. W. Aston Jones, who was one of the assistant masters in the day school; and Mr. Francis W. Bedford, whose untimely end they all regretted. But, although this was a sad record, on the other hand they had much that was pleasurable to dwell upon, first and foremost being the honour bestowed on their past-president, Sir Aston Webb, R.A.; while Mr. John Murray, one of their vice-presidents, had been appointed Surveyor to the Crown: indeed, it would not be an exaggeration to say that with few exceptions nearly all of those who were doing good and thoughtful work were either members of the Architectural Association or had been in the past.

The Success of the Day School

under Mr. Maule and his assistants had been phenomenal. The opportunity students had of obtaining a grounding in the rudiments of their work—a direction in the right path of learning—was of incalculable benefit, and it would be a great advantage to those whose future lives were cast in the provinces if they also could reap the benefit of these

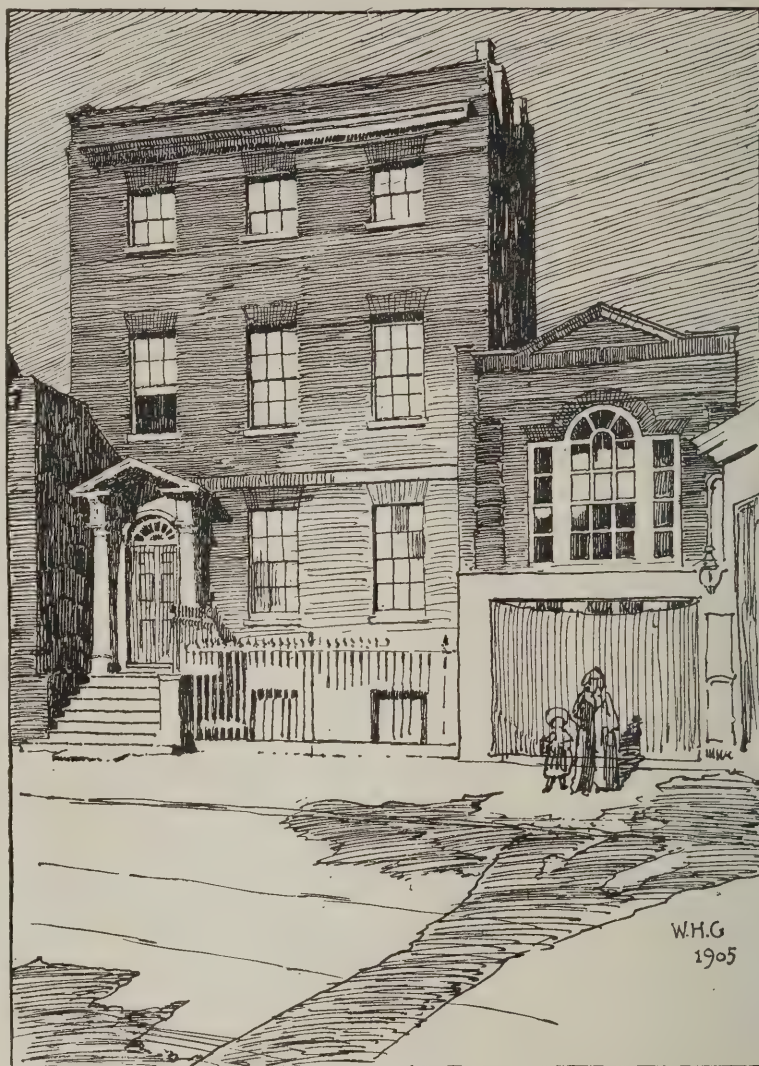
classes and undergo a systematic training before returning to take up their labours in the country.

The Board of Architectural Education within the last few months had formulated a syllabus and report upon architectural training, which doubtless would be adopted by all the recognized institutions throughout the country; and this the president said he regarded as by far the most important step towards the advancement of architectural education that had ever been taken.

The Association had readily acquiesced in the recommendations of the board, whose syllabus, agreeing very nearly with that followed in the day school, had been adopted, so that the Association's own system of training now co-ordinated very closely with others, yet maintained absolutely its individuality as a school, which was the primary object of the Association.

Exemption from the R.I.B.A. Examinations.

The council of the Royal Institute of British Architects had resolved that the drawings done by students in the day school during the first and second years might be submitted by candidates for the intermediate examination instead of the usual testimonies of study, and eventually they hoped that students who had completed the four years' course in the day and evening schools might be exempted from passing the intermediate examination, on the same lines as at Liverpool and elsewhere.



ANDOVER HOUSE, CROYDON, ABOUT TO BE DEMOLISHED.

This delightful old red-brick house is on the east side of South End, Croydon. Its demolition is to be regretted. The porch has some fine marble columns, and the interior possesses two or three beautifully-carved chimneypieces of early eighteenth-century date. The above sketch is by Mr. Walter H. Godfrey, of London, S.W.

Evening Classes.

Last session the Association had established an evening continuation school, under the mastership of Mr. T. Frank Green, for the purpose of enabling more of those students who had passed through the two-years' course and had entered offices to carry on their work without intermission. The experiment was thoroughly successful, though naturally the numbers were limited. This session they expected to do much better, and to make this course, which was so indispensable an adjunct to office training, one of the most important. The studio work—the real foundation work of the Association—had also done well under Mr. Lewis, but several of the other classes had not met with the support they should, notably the modelling class under Mr. Pomeroy; this was to be regretted in view of the fact that the study of the use of ornament was so essential for students. Some day he hoped the Association might be able to establish a class for drawing and modelling from the life, which was an invaluable aid to learning proportion.

It was matter for regret that only one competitor came forward for the Association Travelling Studentship, as this made it dull both for the Association and the student. This was such an admirable prize, and the work that had to be done was evidence of such all-round knowledge and efficiency, that he trusted in future it would be better competed for.

The whole teaching of the Association was becoming so widely known that it was already a recognized practice for students from New Zealand, Australia and the other Colonies who came over to this country to become members in order to further their education.

The Old and the New Association.

On the other hand, it had not been possible to do all these things without some few detractors, and there were critics who decried the work and said that the Association had no right to launch out into these large educational schemes, urging that the old feeling of comradeship was being swamped under the new *régime*. In reply to that criticism Mr. Dawber said that when the Association numbered a few hundreds unquestionably the idea of mutual help and teaching carried on by its own members was admirable, and worked well, fostering a sense of good fellowship which to some degree might be absent to-day. But every other profession was pushing forward on the road of knowledge and giving greater educational facilities for its students, and therefore it was not a time for architecture, which had so lagged behind in the past, to stand still and see other institutions outrival it in the field of education. With a membership nearing 2,000 the Association had to face the altered condition of things, and if it meant to hold its own as an architectural training-ground the establishment of a systematic and definite curriculum as now taught in their schools and in the studio appeared only the natural outcome and development of the original classes. Yet the danger to guard against in all education was in making the training stereotyped and cut-and-dried, and as a



THE LIVERPOOL MEMORIAL TO MEN OF THE KING'S OWN REGIMENT.
W. GOSCOMBE JOHN, A.R.A., SCULPTOR.

(For particulars see next page.)

consequence turning out large bodies of students whose ideas and methods were formulated into one set channel and whose after-work was bound therefore to suffer from a cramped and too academic training. It could not be sufficiently understood that the scheme of education established by the Association formed only the basis and foundation upon which the student himself must build up the superstructure of his own career and individuality. It would be a mistake if, in making a student's work plain and easy for him and in giving him all these advantages, people should imagine he had only to go through the courses and that then his architectural training was complete. Such an idea would be most unfortunate and entirely at variance with the aims of the Association.

The Artistic Temperament and the Business Instinct.

Mr. Dawber went on to speak of the qualities necessary to make an architect, qualities generally considered impossible to find together in one individual, namely, the artistic and sensitive temperament of the artist with the orderly and common-sense methods of the man of business. Indeed, architecture was to a certain extent more capable of being judged by common-sense methods than any other art, which was doubtless the reason why common-sense people of other professions often thought they would make better architects than those they employed! The general public were more apt to regard architecture as a business than an art—partly because it was ruled more or less by common-sense principles and partly because the accepted method of payment was more business-like than artistic, though a time might come when this would be changed for a scale of charges more in accordance with a man's standing and reputation in his profession.

Mr. Dawber urged students to learn all they could about the routine and working of everyday business, to find out all they could about specifications and materials and everything that pertained to the practical

side of their work, and said it would be an admirable thing for a student to get on a building for some months under a capable clerk of works and see the work carried on from day to day.

The Cheap Cottages.

Referring to the Cheap Cottages Exhibition at Letchworth, Mr. Dawber said it did not seem to have been entirely successful, and it was open to question if much real progress had been made towards a solution of the problem, but architects would do well to pay a visit to the exhibition and study the cottages from a practical point of view.

The main idea and principle governing all good design, both in plan and elevation, was suitability for its purpose, but at Letchworth too frequently no enquiry seemed to have been made by the designers as to the mode of life and the requirements of the people for whom these cottages were primarily intended. Only an intimate experience of the working classes, their needs and habits and casts of mind, could enable any architect to cater for them rationally and well; indeed, without a thorough acquaintance with the requirements of one's clients it was difficult for an architect to produce a satisfactory building. But in other ways the exhibition was instructive and interesting, as showing that, after all, the cheapest and best buildings could be erected in brick and tile and of the natural materials of the country, and also as evidence of an endeavour on the part of architects to deal with the multiplicity of newer and cheaper materials in an artistic yet sensible manner; and though many of these did not lend themselves at present to a very sympathetic treatment, much had been attained in that direction. In using new materials an architect had to be more circumspect than his predecessors, and he had to discriminate in their use, as in adopting any of them he assumed responsibility for their good qualities.

The Public.

In conclusion the president dealt with the position of the public in regard to architecture. He said that when it was realized that the street was the architect's picture gallery, and that when he erected a building in a public thoroughfare, country road, or wherever his commission might lie, his work was on exhibition, not for a few months but for years to come, then the architect would recognize the responsibility of his task, and the public, if their attention were drawn to its good or bad qualities, would soon begin to take an interest in and criticize the work. Not that they did not criticize, and freely too. This, perhaps, to thoughtful men was the most disheartening and unsatisfactory part about it; for people who would be dumb before a picture or piece of sculpture let loose with the assurance of absolute ignorance the invective of their opinion on architecture, quite regardless of whether they were right or wrong. Indeed, the standard of taste in this country with regard to architecture was such that often a really fine and dignified work passed unnoticed or merely excited ridicule because it was unusual and not in accordance with the popular taste. The lack of appreciation was due not to apathy or indifference but simply to want of knowledge.

On the Continent it was the custom for an architect to sign the buildings which he had designed and erected, and Mr. Dawber expressed the opinion that if this were done in England it would tend to make architects more careful of what they produced, as they would then have to stand or fall by their works. This would naturally be unnecessary in every instance, but if an architect felt he had produced a building worthy of his art there was no reason why it should be considered in any way derogatory to his calling for him to sign his work any more than in the case of the painter or sculptor.

If this were done generally it would possibly tend to raise the quality of their work and would in time arouse the interest of the public. But if we wished to produce architecture worthy of admiration it was essential that we should educate and train ourselves and spare neither time nor energy in the study of our art.

A vote of thanks was proposed by Mr. Leonard Stokes, seconded by Mr. John Murray and supported by Mr. Louis Ambler and Mr. E. T. Hall. The president replied, and in conclusion announced that the next meeting would be on October 20th, when Mr. Andrew Oliver would read a paper on "The Ecclesiastical Architecture of the City of London," illustrated by lantern views.

Enquiries Answered.

Girder Work.

LONDON, S.E.—STUDENT writes: "Which is the best way to carry two plate girders—20ins. deep by 16ins. wide—(carrying 18ins. walls) over a cast-iron column at the corner of a building?"

For a single-web plate girder the best connection to a cast-iron column is shown in Fig. 1, the lower flange and the web being bolted to the column. The condition of loading is shown in Fig. 2, and the calculation of stresses is given below:—

D = outside diameter of cast-iron column in inches.

d = inside diameter of cast-iron column in inches.

I^0 = moment of inertia of same about an axis through centre of gravity, in inches⁴.

e = eccentric displacement of the load in inches.

P_1 = the load in lbs. on one bracket.

P_2 = the load in lbs. on the other bracket.

s = extreme fibre stress in lbs. per square inch.

A = area of cross-section of the cast-iron column.

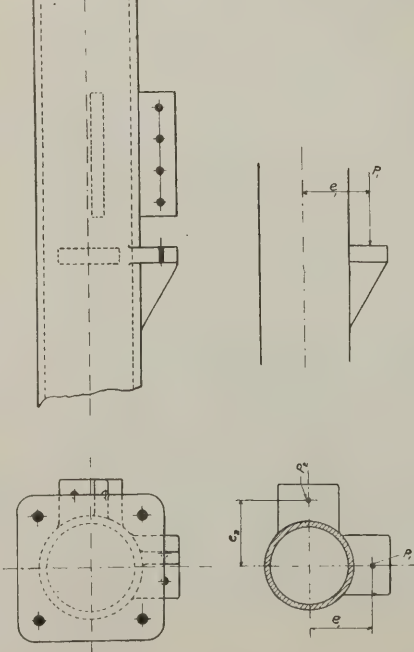


FIG. 1.

FIG. 2.

Assuming the load is placed midway on bracket, which is 4ins. wide, e is equal to $\frac{D}{2} + 2$. The bending moment created by $P_1 = P_1 \times e$ and by $P_2 = P_2 \times e$. The fibre stress due to direct compression is $\frac{P_1 + P_2}{A} = s_1$

and due to bending $\frac{(P_1 + P_2) \times e \times D}{2 \times I_0} = s_2$.

The total fibre stress in the extreme fibre s is the sum of s_1 and s_2 , and should not exceed the safe working stress for cast-iron columns with certain relation between length and radius of gyration. S. V.

Strixton Church, Notts.

WELLINGBOROUGH.—C. O. G. writes: "Is there anything worth measuring in Strixton Church, Northampton, for the R.I.B.A. intermediate examination?"

Strixton church is one of the most suitable churches for the modern architect to study, on account of its simplicity and the exquisite proportions of its parts. There is scarcely a feature in the whole church which would make a full sheet of measured drawings, unless it be either the double piscina or the rood screen. Perhaps the best way to produce a suitable testimony of study would be to measure one whole elevation, preferably the east or west end. H. Y. M.

Architects as Arbitrators.

DOUBTFUL writes: "In a case where the two partners of a firm of architects are stipulated in the contract as sole arbitrators between client and builders, is it legal for either partner to witness the signing of agreement or must some other person be called in for this purpose?"

It is quite legal, but it might turn out to be undesirable, inasmuch as if any dispute arose as to the authenticity of the agreement it would be necessary for the arbitrators to be witnesses at the arbitration held by themselves! A building agreement does not require to be attested to be valid. Therefore the attestation clause is surplusage. If such an agreement has to be attested, and it was attested by the arbitrator appointed in it, in no case would the agreement be illegal, although possibly it might conceivably operate so as to make the appointment of the arbitrator void in certain rare cases.

S. P. J. M.

A LIVERPOOL MEMORIAL.

THE Liverpool Memorial to men of the King's Own Regiment, illustrated on the preceding page, was unveiled by Sir George White on September 9th, and is the work of Mr. W. Goscombe John, A.R.A. Upon the central pedestal stands a figure of Britannia in the attitude of blessing. At either corner of the curved parapet are soldiers, one of 1685 (in which year the regiment was enrolled) and one of 1902. In front of the pedestal are regimental trophies, and at the back is a drummer boy of the time of the battle of Dettingen. The names of all the men who fell in battle or died of wounds or disease are carved in the face of the parapet. The very fine bronze was cast by Mr. A. B. Burton, of Thames Ditton. The pedestal is of finest grey granite and is the work of Messrs. Kirkpatrick Brothers, of the Manchester Granite Works, Trafford Park. It covers a ground space 21ft. square and is 14ft. high, or to the top of the figure 22ft. high. In its construction about 120 tons of granite have been used, the centre block having been cut from a block containing 15 tons; and more than 5,000 letters have been cut in the stone. The memorial occupies an excellent position in St. John's Gardens and has received very high commendation.

ARCHITECTURAL SCULPTURE.

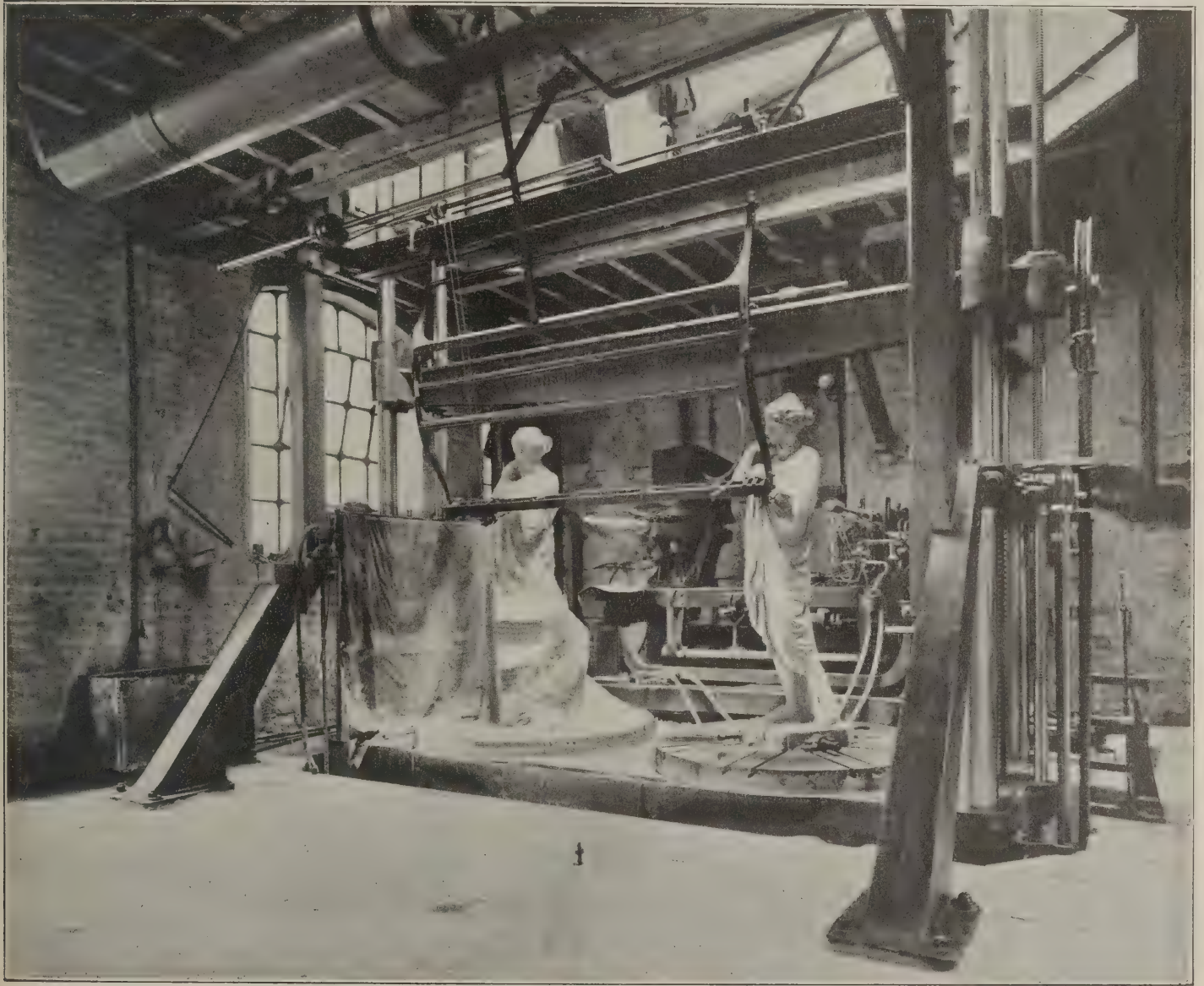
An Important Invention.

A REMARKABLE machine has recently been constructed at the works of the Sculpture Syndicate, Ltd., 62 and 64, Sumner Street, Southwark. This machine (of which a specially taken photograph is here given) will reproduce models of statues up to 10ft. in height, 5ft. 6ins. in diameter and 20 tons in weight. It is by far the largest in existence and seems capable of doing the biggest work that could reasonably be required. Statues seldom, if ever, exceed 10ft. in height in one piece; if required larger they can, of course, be

The machine has been designed by the general manager of the syndicate, Mr. Gaze. It will be seen that the model is placed on one revolving table and a block of stone on the other. The pointer and cutter are on a travelling carriage at the back. The method of working is to run the pointer over the model, which latter is turned round gradually. The block of wood on the pointer is for the purpose of keeping the point some distance away from the model during the first rough cutting with a large and powerful drill. The cutting drill travels at a great speed. Each table is on ball bearings and will sustain 20 tons weight. These circular tables not only turn round horizontally, but at the same time can be raised or lowered vertically;

be cut in stone with great ease. Thus the machine has many possibilities in the way of doing intricate stone detail, apart from statues and carving. The machine is also economical for pointing the stone for sculptors to work in the ordinary way.

The finer finish on a statue is done simultaneously from the front by the overhanging trapeze arrangement shown in our view. This is so precise that the stone is left in the exact state required by the sculptor for finishing. It should be clearly understood, however, that the work done by the machine in no way affects the artistic quality of the sculpture. The machine simply does the work which in the ordinary way would be performed by the sculptor's assist-



THE NEW AUTOMATIC SCULPTURE AND STONE-WORKING MACHINE.

worked in portions on this machine to any size.

The original machine which the company used, and still uses, was invented by an Italian sculptor, Signor Bontempi, but it can only take figures up to the size of about 3ft. The present machine is a very great advance on the former one, and is entirely different in construction, except for the hydraulic valves that operate the drills—these valves constituting the chief feature in Signor Bontempi's patent and ranking it superior to other automatic sculpture machines. The valves are so delicate that the slightest pressure will move the machine, whereas other machines need special models cast in iron to avoid the original being damaged by great pressure on the indicating point.

in fact, the whole machine is a colossal vertical lathe with travelling cutter.

The possibilities of the machine for architectural work are great, because it will be seen that by placing a block of stone on the table it can be turned not only into a column, but by lowering the table and at the same time turning this round spirals can be worked, and the reversing arrangement on the machine enables spirals to be cut parallel, both coming down and going up, thus saving time. The whole contrivance is quickly lowered and raised, so that it can be advantageously used for fluting columns, and it will do what an ordinary lathe will not do, namely, put a square cap on a column. In fact, by the use of ordinary templates almost any geometrical form can

ant, the work being in every case finished by the sculptor in the usual way. It is noteworthy in this connection that the Sculpture Syndicate make a special point of the artistic side of their work, and we understand they have secured the services of Mr. Courtenay Pollock, R.B.A., to personally supervise their sculpture.

The power of the machine may be judged from the fact that it will make a 3in. cut 4ins. deep in Corsham stone. The saving in cost by this machine is apparent when we see that statues so roughed out can be executed at about one-third the cost they would be by hand.

The firm have a number of other remarkable machines for woodwork, one of which makes forty thousand cuts per minute.

MR. PERKINS PICK ON THE DECLINE OF HANDICRAFT.

AT last week's opening sessional meeting of the Leicester Literary and Philosophical Society Mr. S. Perkins Pick, F.R.I.B.A., delivered his presidential address, taking for his theme the decline of artistic handicraft. It was generally admitted, he said, that the masonry of mediæval times exhibited greater excellence in workmanship, combined with suitability in design, than that done to-day. It was to be remembered, however, that the social, political and industrial conditions of those times differed entirely from those of the present. There was no contracting in the modern meaning of the term, and there was no competitive system by which the individual was encouraged to shape his policy to suit his own ends and to disregard his duty to others. Members of the craft were banded together for the common good in their trade guilds. Craftsmen were then of some importance, and had complete control of the various matters connected with their trade. It was an age of small employers, every one of whom was compelled to belong to the guild before he was allowed to work. Rules were stringent with regard to proficiency and training. For example, quoting from a warrant of an old masons' guild, "If incompetence is proved against any mason, he is fined by the guild; a second conviction is followed by a second fine; and a third by expulsion from the guild and the fore-swearing of the craft for ever."

Apprenticeship.

In those times no one was allowed to enter the craft except through a seven years' apprenticeship. The number of those who entered was strictly limited, and every master was in duty bound to give personal instruction to his apprentices. The chief object of

the guild conditions seemed to have been to ensure that only the best class of work should be done. The methods adopted, as no one who had studied their beautiful mediæval buildings would deny, produced a body of craftsmen who were incomparably superior to the present-day workman, and whose like they would probably never see again. The mediæval apprenticeship customs prevailed in all handicrafts from early days to the end of the eighteenth century, when manufacturing, with its specializing in departments, generally destroyed that unity which was such a valuable outcome of the old-fashioned methods. With the Victorian era there came in a so-called freedom of treatment which offered encouragement to a variety of shams. He used the expression "Victorian era" because it was a convenient one, and not with the intention of implying that we in this country were alone to blame. As a matter of fact, what occurred in England was also experienced throughout all the more civilized countries of Europe.

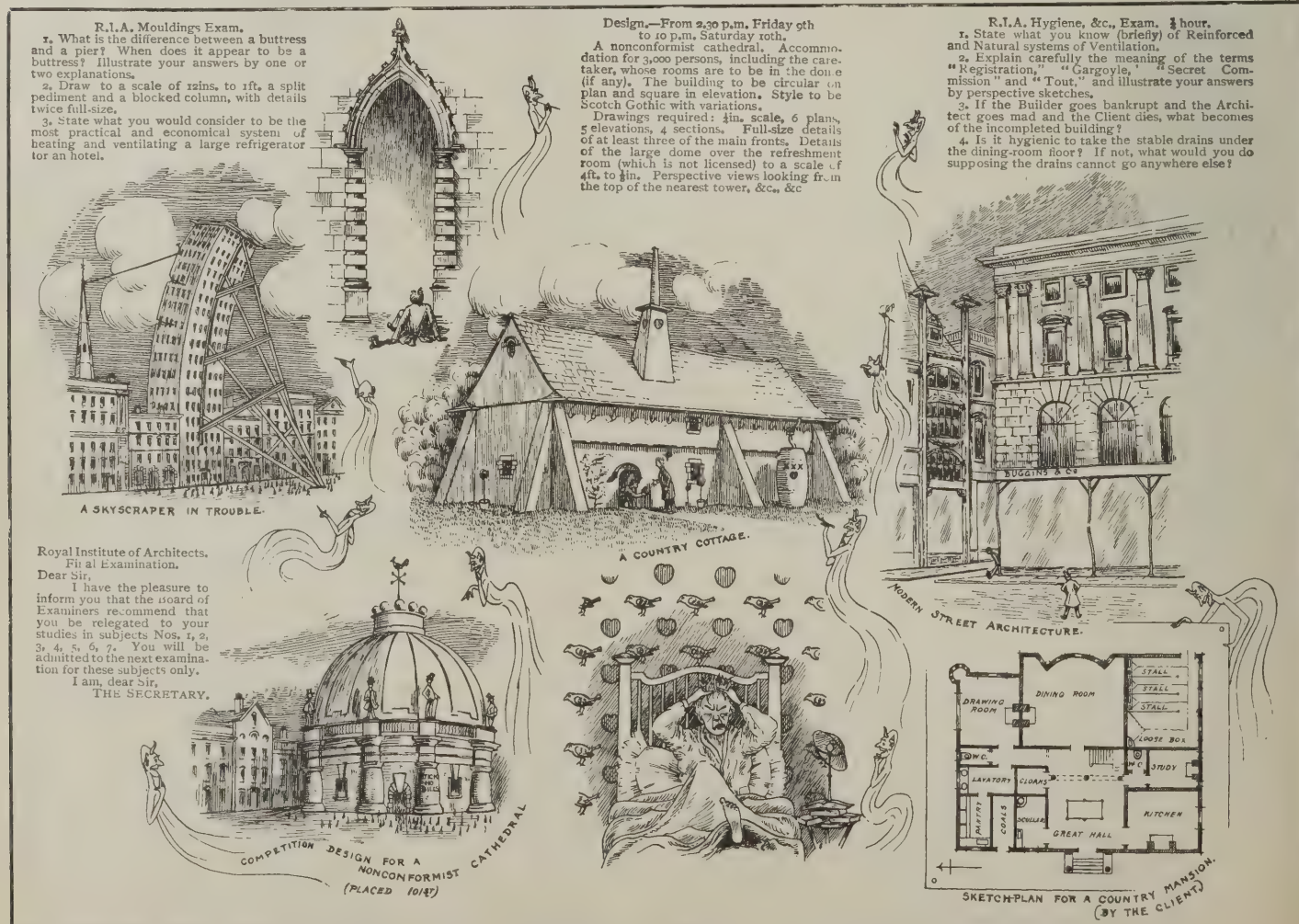
The Machine and Art.

Referring to this question, Mr. Pick said that in all probability it was impossible to give that human interest to machine-made articles which the old handicraft goods possessed, but there was not a doubt that men of good taste could enormously improve upon the work generally produced if their services were requisitioned by those who had the power to direct the process of manufacture, for machine-made articles were not necessarily ugly. It was a most regrettable sign of our times that very few manufacturers or tradesmen tried to make the best and most suitable articles to satisfy their own judgment, but rather aimed at pleasing the public taste, which had become debased by the contemplation of the ugliness which abounded on every side.

Commenting upon the appearance of modern streets in Leicester and the "improvement" to the High Street as rebuilt, he said that the corporation made it a condition that the sale of the land was subject to the architecture of the street elevation being approved. The result showed how difficult it was to carry out the condition with any degree of success. It might not unreasonably be said that this was the fault of architects, and therefore there was no occasion to accuse the public of want of judgment or the corporation of lack of taste. Doubtless to some extent that was true, but was not the real cause more deeply seated, namely, that the public demanded the impossible from the architect and the builder? The business man knew full well that, without the glaring lamps, the shouting advertisements and the large plate-glass windows, he would have but small chances of attracting purchasers, and yet they would readily admit that these commercial necessities were the foundation of the ugliness which prevailed in their business thoroughfares.

Finally, he said that a cemetery of to-day was representative of the general taste of the age, exhibiting how commercialism had invaded even our last resting-places.

The "Auld Brig of Ayr": Engineers favour Repair rather than Rebuilding.—The opinion of the engineer who made a report on this bridge on behalf of the Society for the Protection of Ancient Buildings is favourable to the retention and repair of the existing bridge, and this opinion is supported by reports sent in by other engineers. As the scheme of repair will cost considerably less than the erection of a new bridge, it seems impossible that the town council can come to any other decision than to retain Burns's bridge.



THE ARCHITECTURAL STUDENT'S NIGHTMARE (THE RESULT OF AN OVERDOSE OF EXAMINATION).

Law Cases.

Workmen's Compensation : Another Case.

—A workmen's compensation case against Messrs. Spencer, Santo & Co., Ltd., was heard last week at Southwark. The claim was made by the widow of a workman named Smith for £300 damages for the loss of her husband. Smith was a ganger in charge of a mortar crusher at the Union Jack Club, Waterloo Road (in course of erection), and while watching the machine at work the belt slipped off and he was caught and killed by it. Counsel for the respondents said that a specific order had been given to Smith and the other men "not to meddle with the machinery," and in going round from a place of safety to within reach of the flying belt Smith was "meddling with the machinery." Therefore he had been guilty of "serious and wilful misconduct" within the meaning of the Act, and the claim for compensation could not be sustained. His Honour: If that is your idea of serious and wilful misconduct, you had better drop it at once. He would have been less than an intelligent being if he had not gone round. It is not in human nature for a man who is in charge of machinery to see an accident and not to go up and see what is the matter. There is no evidence whatever of the man's meddling with the machinery.—An award was made in favour of the widow for £240 and costs.

Competitions.

A School at Derby is proposed to be erected between Clarence and Porter Roads. In a recent competition for designs Messrs Hunter & Woodhouse, of Belper and Derby, were awarded the first premium of £50, and Mr. T. H. Thorpe, of Derby, was awarded the second premium of £20.

Epsom Church.—Seven architects were recently invited to submit designs for the rebuilding of the parish church at Epsom. These were Messrs. Banister, of Epsom, A. Bidlake, C. H. Mileham, J. Hatchard Smith, Charles Spooner, Temple Moore and Sir Charles A. Nicholson & H. C. Corlette. Mr. G. H. Fellowes Prynn, the assessor, has selected the design by Messrs. Nicholson & Corlette.

A Newcastle School Competition.—Mr. Arnold Mitchell, F.R.I.B.A., the assessor in the competition for designs of schools at Bolam Street, Byker, Newcastle-on-Tyne, has awarded the first place (entailing the commission to carry out the work) to Mr. W. H. Knowles, F.R.I.B.A. of Newcastle; the second place, with premium of £30, to another set of designs by the same architect; and the third place, with premium of £20, to Messrs. Marshall & Tweedy, of Newcastle.

Hove Public Library Competition.—The assessor in this competition, Mr. John Pelcher, F.R.I.B.A., has reported to the Corporation of Hove that as "the authors have all either not complied with the conditions or the designs are otherwise defective" he is unable to make any award or advise the Corporation to accept any of them. In the case of designs which do not comply with the conditions of the competition, it may be correct to withhold the premiums, but in those "otherwise defective" we think the pledges of the Council should be carried out, and we shall be glad to learn that the assessor and the Corporation have decided upon whom to award the premiums. A definite promise was also made as to the public exhibition of the designs, and when this is fulfilled competitors and public will be able to judge whether the designs are all so inadequate as to preclude the possibility of slight modifications making them serviceable.

BELGIAN CEMENT.

Fraudulent Practice of Selling it as English "Portland."

IN his report on the trade of Belgium for the year 1904, just issued by the Foreign Office, Mr. Consul-General Hertslet makes some interesting remarks about the cement trade. He says that although the exports of minerals from Belgium increased considerably in 1904—and the mineral trade is principally composed of cement—the exports of home-manufactured cement declined from 599,091 tons in 1903 to 588,295 tons in 1904, the respective values for the two years being £623,040 and £564,762. The exports to this country show an increase of 116 per cent. in volume and of 26 in value, the figures for 1904 being 231,213 tons, of a value of £221,964. This far exceeds the exports to any other country, as it comprises more than one-third of the total.

From the above figures it would appear that the average value of exported cement is somewhat below £1 per ton. Prices during 1904 continued to be very low and the profit to manufacturers was but small. Orders for "Portland cement" of Belgian manufacture were unremunerative, but during the present year they have been gradually improving, owing to an understanding which has been arrived at between the German and Belgian manufacturers. A syndicate was recently formed between the manufacturers of Belgium, Germany and the Netherlands, which is to remain in force for nine years from January 1st last. This combination of manufacturers appears to have had a very favourable effect on the price of cement in Belgium, which has been very low for a number of years, but which now shows every sign of a steady increase.

While referring in particular to Belgian "Portland cement," the Consul-General observes that it may be useful to call attention to the practice of manufacturers in Belgium of describing their cement as Portland cement. "This practice of conspicuously marking cement of Belgian origin with British trade descriptions is carried out in great detail, and many trade-marks of Belgian cement, printed in English, have come under my own notice in connection with the export of cement from Belgium to South Africa and to other countries, including the United Kingdom. Such marks as 'Castle Brand,' with the words 'Special Quality, trade-mark,' are of common occurrence, and practically all large quantities of cement are labelled in plain characters in the English language, with the obvious result of leading purchasers to believe that the goods they are buying have some British connection. There is no doubt that the object of Belgian manufacturers in marking their cement in this way is to imitate the labels of British barrels, and thus to dispose of a quality inferior to the Portland cement made in the United Kingdom as a substitute for genuine British-manufactured Portland cement, at a reduction of a few shillings on the English prices. It is true that the barrels or bags of cement are invariably marked 'Made in Belgium,' but this, in addition to freely advertizing the cement of Belgium, does not warrant the use of the English language in describing goods manufactured in Belgium, especially in view of the fact that the English descriptions and trade-marks are far more conspicuous than the inscription 'Made in Belgium' placed on the barrels."

A Protest.

In connection with this fraudulent practice the secretary of the Associated Portland Cement Manufacturers (1900), Ltd., writes to us as follows: "Unfortunately, the Consul-General is in error in stating that such packages are invariably marked 'Made in Belgium,' for much of the Belgian cement

imported into the United Kingdom comes in sacks bearing in English the inscription 'Portland Cement' or even 'Best Portland Cement' without any indication of its Belgian origin. Hitherto the Customs authorities have declined to insist upon the words 'Made in Belgium' unless the packages also bear the full name or full initials of the English importer; they refuse to recognize that a single initial, even when accompanied by the English descriptive words I have referred to, requires any such qualification. That the foreigner, anxious to sell his inferior article and recognizing the improbability of success when its true origin and character are known, is not slow to avail himself of this loophole is obvious from a letter which now lies before me. Addressed to a firm whose name begins with 'G,' it volunteers the advice that the sacks could be marked 'Portland cement' on one side, and 'G' on the other, without the necessity of adding the words 'Made in Belgium.' If the commissioners are correct in their interpretation of the Merchandise Marks Act, is it not time their hands were strengthened? Meanwhile, the consumer, lulled into a false sense of security by the belief that all foreign goods must be marked with the country of origin, can and should protect himself from fraud by insisting upon being supplied only with packages bearing the full name and address of a well-known British firm."

Cement outside the Combine.

At last week's meeting of Messrs. Martin, Earle & Co., cement manufacturers, who remained outside the combine formed five years ago, Mr. Vavasour Earle, the chairman, said that the profits available for distribution were equivalent to 7½ per cent on the ordinary capital, but the directors had concluded that the shareholders would be more satisfied with 5 per cent., leaving the remaining profits to be carried forward. They expected presently to establish a reserve fund for equalization of dividends. The selling prices last year were 2s. to 3s. per ton less than the average of the first five years, and every additional 6d. per ton was equivalent to 2½ per cent. for increased dividend or reserve. Their advantageous position was partly due to the fact that they were now no longer paying any dividends on unproductive capital. Moreover, they supplied their own raw materials, which they thus obtained at bedrock prices. Their rotary plant had marked advantages when high prices were ruling in the coke market. The company was one that could afford to wait with patience for better times in the trade.

The Need for Protection.

Messrs. Johnson & Co., of Gateshead and Greenhithe, writes as follows: "As regards the continued slump in the price of cement in this country, it is getting to a very acute stage indeed, and has now reached that point when any small profit for the home manufacturer begins to vanish, and it will then be a case of gradual extinction for that home industry, commencing with the weakest, unless something is done, and that very quickly, to prevent the dumping of French, German and Belgian cement on these shores. There is no need to go into the reason for this state of things, as it is well known to all who have studied the matter that the cement is made at a much lower cost in these countries than here, and being protected they get a higher price from their own consumers and so are able to make a good average, although selling at a much lower price here. Much of it is natural cement and does not go through the same process as English, and is inferior in that respect; still, there is a market for it amongst a certain class of buyers, and that, combined with the heavy import of better kinds, helps to draw away orders from our own makers, and consequently we must try to

meet this unfair competition by reducing the price. Either that or we must see our orders going past us, and consequently be compelled to shut down the greater part of our cement kilns and pay off large numbers of our workpeople. . . . It is very hard to see an industry that had its origin in this country being surely done to death by these foreigners, who will not allow an ounce of our cement into their countries. Protection is needed without delay."

GARDEN CITY AND THE LAY CRITIC.

A BREEZY criticism of the cheap cottages exhibition at Letchworth appeared recently from the pen of "Wide-Awake" in the "Liverpool Echo," from which we extract the following, taking occasion, however, to remark that the opinions are hardly those of an expert, but interesting nevertheless as a flippant addition to the various other criticisms which have found their way into print:—

"I have had a peep, gentle reader, at Garden City. Perhaps you envy me, but you needn't. The name Garden City represents a great and lovely idea—one of the distinctive ideas of the twentieth century. At present it also represents one of the most desolate regions in these islands—a very desert of mud and bricks and wooden shanties, in the wind-swept uplands of far-away Hertfordshire. It takes you a whole day to get there* and goodness knows how long to get back, and for your trouble you get a feeling that you wish you had spent your time around a brickfield nearer home. . . . Ten years hence there may be something at Letchworth worth seeing, and by that time it may be possible to travel two

* "Wide-Awake" writes from Liverpool. From London it is possible to get to Letchworth in 55 minutes. "Wide-Awake" might have added that it takes eight days to get there from New York.

or three hundred miles without having to worry lest your family are starving at home in your absence. Garden City, indeed! Looks at present more like a series of hen scratchings and a few advertising spaces for jerry-builders. Oh, those builders and architects and artists! Nearly every cottage looks as though something had happened to it. . . . Many of them go—or soon will be going—on crutches, some have had a mighty

bash in somewhere or other before the baking; others resemble nothing on earth as much as a kick in a mud wall. Some roofs are very handy for sitting on, others for tobogganing, and many for providing the inmates with an inexpensive shower bath. Brodie's concrete Roman villa is hard to beat for external ugliness even at Letchworth. . . . Garden City, you see, has started well by being humorous.

All the Moonstruck Architectural Ideas of the Island

have been let loose there. If I were judge I would award the biscuit and a concrete medal to the genius who designed the circular spider's-web sort of mansion,* with twenty-five doors, sixteen windows, one chimney in the middle, and no upstairs. I tried about a dozen doors, but failed to get in. One door opened into the coalplace, another into the scullery, another into the bathroom, another into the larder, and so on. Then I gave it up.

"The idea of the exhibition, I was told, was to show how a six-roomed cottage could be built for £150. And the way it was done was to build houses costing twice the money—some of them perhaps worth the expense, and others honestly worth about a third of it, if dropped down in some habitable place. . . . The architects should try again."

* Messrs. Cubitt's concrete cottage, designed by Messrs. Hesketh & Stokes.



HOSE TOWER.



L.C.C. FIRE-BRIGADE STATION, OLD KENT ROAD: BILLIARD-ROOM. W. E. RILEY, F.R.I.B.A. SUPERINTENDING ARCHITECT.

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OUR PLATES.

THE London County Council fire-brigade station illustrated in this issue occupies a corner site abutting for a length of 58ft. 6ins. on Old Kent Road and 102ft. on St. Thomas's Road. The accommodation is for a full station, and is contained on five storeys. On the ground floor space is provided for a horsed-escape and steamer, with stabling adjoining for four horses. The two stalls for horses on duty open direct into the engine-room, and swinging harness is provided over the appliances. The ground floor also contains the watch-room, recreation-room (for full-size billiard table), small reading-room, laundry and stores. The upper floors are planned to accommodate eleven married and five single men, including the station officer. The quarters are all self-contained, and have separate sculleries and w.c.'s. Bathrooms are provided on each landing. The elevations are of red brick and Portland stone, and the roof is slated. A series of sliding poles is provided to land the firemen from all the floors to the engine-room, the doors to these poles being operated from the watch-room by an electric switch. The building has been carried out from the designs of Mr. W. E. Riley, F.R.I.B.A., the Council's superintending architect, and was erected by the Works Department in 1904.

OLD KENT ROAD
LONDON COUNTY COUNCIL FIRE-BRIGADE STATION, OLD KENT ROAD.
W. E. RILEY, F.R.I.B.A., SUPERINTENDING ARCHITECT.

Correspondence.

The Estimating Clerk.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I was glad to see your leader on "The Estimating Clerk." As you so frankly and courageously point out, the building trade is being ruined by the present system of competing for work by tendering at such a price that it is impossible to make the work pay if honestly carried out. Coming as I do in close contact with a large number of men connected in various ways with the building trade, I can assure you there is no point on which they are more in agreement than on the value of the building trades as an employment. The mechanics grumble because they are not allowed to do the work in a manner worthy of their craft whenever slipshod methods can be used to save some of the legitimate cost of labour. Foremen grumble because they are expected to carry the works through so as to produce a profit when the estimating has been done on a ridiculous basis, and because they have to scheme to make the job pay by using inferior work and materials, and by adding extras whenever there is the slightest chance.

To state some of the instances in which work has been deliberately shirked and very inferior materials have been substituted for those costing much more would be to render oneself liable to libel; but unfortunately such a proceeding is not necessary, as any reader can no doubt supply instances for himself.

Perhaps the worst cases of all are those in which the extras, whenever they cannot be closely checked, are entered as consisting of a much larger amount of labour and materials than is actually the case. Of course, this is nothing less than downright robbery, yet it is done by builders in a large way.

Perhaps to an outsider the strangest part of this question would be the fact that an architect and often a clerk of works as well are employed to see that the work is properly executed, and that the materials are those specified. An elaborate specification is drawn up at considerable expense to state exactly the materials that should be used in the construction, and the specification, together with the drawings, also defines in a great many instances the actual details of construction to be used. To see that these are properly complied with, a clerk of works is employed at considerable expense, and, in addition, the architect gives at least a portion of his time to the consideration of these details.

Now, it seems to me that these gentlemen are either ignorant of their duties or else they wilfully neglect to serve their employer, as honest men should, whenever shoddy materials and inferior workmanship are allowed to replace the quality specified.

If builders were to be rigidly kept to carefully worded specifications on every occasion when an architect or clerk of works was employed, I fancy we should hear a little less of undercutting prices being employed to obtain work. It is certain that no man could afford to lose on every job he did, as he would have to if he estimated below cost price—with the hope of making some profit by subterfuges—and were kept up to his contract.

Again, the present system of taking the lowest tenders in the majority of cases is one that tends to make matters worse, as those who can cut the most are those who thereby obtain the largest amount of work. If building committees and others having the placing of contracts would investigate the extras on works carried out by those who tendered they would often find it pay to accept a tender much higher in the list. The total cost would be lower and the quality of the work better.

As you have pointed out, the present system of estimating is suicidal, and it also has the effect of demoralizing all who have to help to produce a profit under such conditions. Can it be expected that men will do their utmost when at every chance they are told to scamp the work to save a little? No wonder the old pride of craftsmanship is dying out; how it could grow under such conditions one does not know.

While agreeing with your proposals as to the position of the estimating clerk on large works, it would appear that those who supervise the erection of buildings in the interests of the owner have a good deal of power to stop some of the practices of the builder who presents an unreasonably low tender.

When disputes arise in many instances the builder bluffs those responsible for the proper execution of the work by threatening to take the matter to law, and thus often gets the affair adjusted to his advantage. With carefully worded specifications this practice should not hold, as the builder would have no case.

It is time that the honest men connected with the building trade endeavoured to rid it of these dishonest practices, and on the behalf of such allow me to thank you for your leader.—Yours truly,

LONDON.

R. E. M.

Obituary.

Mr. John Melvin, architect, of Alloa, died recently.

Mr. R. Fulton.—An inquest was held at Rugby last week on the body of Mr. Robert Fulton, aged 72, a builder of Brockley, Kent, who was found dead in a second-class compartment of a train from Scotland recently. Dr. Simpson stated that the cause of death was syncope following exertion, and the jury returned a verdict to this effect.

The late Mr. G. E. Lowry, of Messrs. J. & W. Lowry, contractors and quarry-owners, Jesmond, left estate which has been valued at £20,938.

Mr. T. W. McLaren, partner in the firm of McLaren & Co., builders and quarry-owners, was fatally injured recently by a fall of stone while superintending the building of a sewage tank at Low Mickley, near Prudhoe, in connection with the sewage scheme of the Hexham Rural Council. He was only 30 years of age.

Builders' Notes.

Glass Bricks.—No. 295 of the United States monthly consular reports contains reports from American consuls in Europe with regard to the manufacture and use of paving bricks from glass. The best reports are from Havre, Lyons, Berlin, Dresden and Barcelona.

Bristol Association of Clerks of Works and Builders' Foremen.—At a special meeting of this Association held on Thursday evening last, Mr. George Crispin (of the firm of Messrs. James Crispin & Sons, horticultural builders) gave a lecture on heating and hot-water apparatus for buildings, illustrated by blackboard sketches. The lecture awakened much interest and was highly valued.

Rural Building By-laws.—A recently issued return shows that in 246 rural districts in England and Wales—out of a total of 668—there are no by-laws for the regulation of new buildings. In 169 districts and in parts of 114 there are by-laws based on the urban model, in 106 districts and in parts of 32 there are by-laws based on the rural model, and in 11 districts and in parts of 6 the by-laws are not based on the model series but were mostly made before the first issue of the model in 1877.

Keystones.

For a new Cottage Hospital at Abertillery, Mon., Mr. Arthur E. Sheppard, of 39, High Street, Newport, has been appointed architect.

Change of Address.—Prof. F. M. Simpson, F.R.I.B.A., has removed from 137 to 88, Gower Street, W.C. (telephone, 5,737 Central).

Partnership.—Mr. W. H. Seth-Smith has taken into partnership Mr. William Ernest Monro, who has been associated with him in practice for the past fifteen years. The practice will be carried on under the style of Seth-Smith and Monro.

Mr. William Bevan, F.R.I.B.A., has resumed practice at 6, Parliament Chambers, Great Smith Street, Westminster, owing to the abolition of the office of chief architect to the Transvaal Government, which office until quite recently he held.

The Academy Professorships of Sculpture and Architecture.—No successors have yet been appointed to the posts formerly held by Mr. Alfred Gilbert, R.A., and Mr. George Aitchison, R.A., and the Royal Academy has been unable, therefore, to make the usual announcements of winter addresses by its professors of sculpture and architecture.

Frascati's Restaurant, in Oxford Street, has been redecorated in a scheme of blue, white and gold, and the Winter Garden has been enlarged by the addition of a new wing, this being rendered possible by the removal of the kitchen to newly-acquired premises in the neighbourhood. Over the new wing a commodious masonic hall has been built, Mr. Charles H. Worley, F.R.I.B.A., being the architect.

City Streets Lighted by Gas Once More.—Gas lamps with duplex incandescent mantles have now been erected in place of the electric light standards in Queen Victoria Street, Queen Street, Lower Thames Street, Monument Street and Fleet Street. Fleet Street has thirty-four gas lamps, giving an effective light of more than 5,000-c.p. near the pavement level, at a cost of £207 a year, in lieu of twelve arc lamps giving 6,000-c.p. far above the pavement at a cost of £312 a year.

The new County Hall.—Negotiations for the purchase of the properties on the Westminster Bridge Road site for the new county hall of the London County Council are stated to be progressing, and the Establishment Committee hope shortly to be in a position to report definitely on the matter. An article on the proposed building, written by Mr. John Burns and illustrated by some fine sketches by Mr. Hedley Fitton, appears in the current issue of the "Pall Mall Magazine."

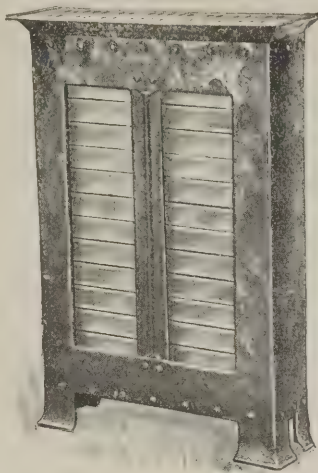
300 Mistakes in Drawings.—At last Wednesday's meeting of the Leeds City Council Councillor Armitage, chairman of the Waterworks Committee, said that the new waterworks engineer had found 300 mistakes in twenty-nine contract drawings for the reservoir at Colsterdale. Work had accordingly been stopped. In one case the plans provided for the construction of a bridge which terminated at one end 4ft. above ground level, so that a horse and trap would have to jump that distance on leaving or entering the bridge, while another bridge, to cost £800, was left out of the plans altogether. In another case a proposed embankment would be threatened by a landslip equal to a million cub. yds. of boulder clay. The tunnel which brought the water through the embankment had curves and tangents that were wrong, and the tunnel itself did not meet; the drains would not carry the water away; and for the trench alone there would be an extra of £227,000 on the original estimate of £300,000. One result of these mistakes is that the corporation have had to acquire fifty additional acres from Lord Masham.

THE ELECTRICAL EXHIBITION.

DESPITE the rapid and important growth which has been made in electrical work in this country, thirteen years have elapsed since an exhibition embracing all the various branches of the industry has been held. The exhibition now open at Olympia is therefore of particular interest, more especially as it has been organized under the patronage of the Institution of Electrical Engineers and under the auspices of the National Electrical Manufacturers' Association. The great hall is entirely filled with stands presenting a vast number of interesting exhibits. A great number of them are quite outside our own sphere—such as those relating to dynamo construction, tramways, &c.—but we may opportunely refer to those exhibits with which architects and builders are more or less concerned, either in the fitting-up or electrical decoration of buildings.

Radiators.

At this time of year people are beginning to think of the winter and the necessity for providing suitable heating apparatus. This is a field where electricity is making considerable advance, though it must be admitted that the very merit which is claimed for electric light as one of its advantages over gas—namely, that while giving illumination it does not produce undue heat—necessarily has an opposite application in regard to electric heating, though the method of employing current for such purpose is different to that for lighting. There are two methods of warming by electricity—one by producing heat rays which extend throughout the room and warm all the furniture, &c., which in turn warms the air passing over it, and the other by warming the air direct. Radiators of the former type are to be seen on numerous stands at the exhibition, more particularly on that of the Dowsing Radiant Heat Co., Ltd., of 24, Budge Row, E.C. This firm exhibits a great many varieties, in most of which four long frosted lamps are fitted in front of a copper reflector. This constitutes the standard type of radiator, consuming 1 unit of electricity per hour. At heat rate, current in some places—though unfortunately in very few—can be obtained as low as 1d. per unit, in which case a radiator would cost 1d. per hour full on and ½d. half on. Switches enable the lamps to be turned on and off whenever desired, and as the heat is given



PROMETHEUS ELECTRIC RADIATOR.

out at once these radiators are very convenient for warming offices, bedrooms, &c., while the fact that they also give a cherry light adds to their attractiveness: it is our experience, however, that the globes are rather liable to be broken and are costly to replace. The cost of the radiators themselves ranges from £3 15s. upwards.

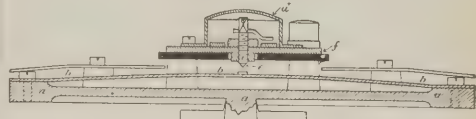
The second type of electric heating apparatus is admirably exhibited by the British Prometheus Co., Ltd., of Kingston-on-Thames (London showrooms, 27, Ely Place, E.C.). These radiators consist of a metal body, in front of which are arranged two series of mica slats coated with a metallic film, with two ruby lamps behind, so as to give the whole a reddish cosy appearance when lighted. This is a very effective type of radiator, and it is made by this company in a great number of most attractive varieties. Architects who are in want of something neat and serviceable should take note of this exhibit. The cost of the radiators is practically the same as the other type referred to above, and the current consumption is, we believe, the same. One of the most recent buildings for which they have been adopted is Ingram House, Stockwell, the hotel for city clerks, &c., now being erected from designs by Mr. Arthur T. Bolton.

The General Electric Co. show some wood-cased radiators, of fire-resisting material,

which lend themselves to an infinite variety of decorative treatment at moderate cost, which would be prohibitive if treated in metal on similar lines.

Fire Alarms.

Several varieties of electric fire lamps are to be seen at the exhibition. The Pearson Fire Alarm Co., Ltd., of 62, King William Street, E.C., have an important exhibit showing their system in all its applications. The essential feature of this system is the thermostat, which is a very simple device consisting of a little metal strip firmly fixed at each end. This expands on the application of heat, stretching up and making contact with a pointer above, and thus setting in operation the whole of the bell-ringing system. The thermostat is so constructed that the distance between the pointer and the metal strip can be regulated simply, and thus the alarm can be set to ring at any desired temperature. We ourselves had one of these thermostats set to about 80 degs., and then breathed on it, when almost immediately the gongs and bells on the stand were set ringing. It would occupy too much space to go into all the details of the system, but we may briefly state that it is admirable



THERMOSTAT OF PEARSON FIRE-ALARM.

for factories, workshops, town halls and other large buildings, as it establishes automatic connection between the scene of the fire and the nearest fire-brigade station, so that immediate notice of an outbreak is given; in fact, there have been cases where a fire has broken out, the call has been given to the fire-brigade station, and the firemen have arrived on the scene and actually been the first to acquaint the occupants of the existence of a fire on their premises.

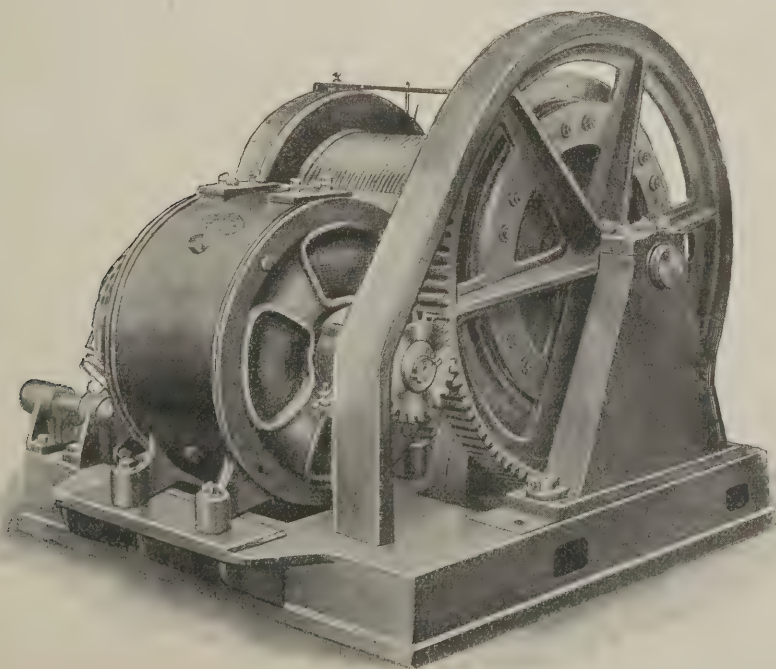
At the stand of the General Electric Co., at 71, Queen Victoria Street, E.C., a number of other fire-detectors, alarms and telephone fire-brigade calls are shown. The exhibit includes several types of thermostats, especially the very neat one illustrated below,



which is operated by the expansion of air in a sealed chamber, causing one side to bulge outwards until contact is made with the set-screw at the top of the thermostat. The cost of this little device is only 5s. Another type consists of a copper wire about 7ft. long, which is fixed near the ceiling of a room and has a carbon contact block suspended from the centre of it. When the temperature rises the wire expands, lengthens and sags, and thus contact between two springs is made by the carbon block.

Messrs. Joseph Kaye & Sons, Ltd., of 93, High Holborn, show "K's Patent Electric Firm-alarm Lock," which enables the person in charge of a building, by pressing a button, to instantly open all the doors fitted with this patent.

Still another type of fire-alarm apparatus is the pyrophone, exhibited by the Pyrophone Co., of 52, Queen Victoria Street, E.C. It consists of a bent glass tube with one branch exposed and the other covered with insulating material. One part detects the sudden outburst of fire, while the other is designed to detect a slow or smouldering fire. This apparatus gives first a danger call, then a fire call, and then a trouble call in the event of any disorder arising in the system; which is



HAULING GEAR OPERATED BY "WITTON" MOTOR.

of the utmost importance, because a fire-detecting apparatus in an inefficient condition is worse than useless.

Electric Photo-copying.

One or two stands at the exhibition deal with the production of copies of drawings by electric light, apparatus being shown to enable this to be done with speed and regularity. Messrs. J. Halden & Co., of 8, Albert Square, Manchester, show a large continuous photo-copying machine. This is made either in single or double form, the machine exhibited being of the latter type. Three arc lamps are arranged in the centre, and the tracing and paper are fed over rollers on either side, so that two different copies can be taken at the same time, while long rolls—even as long as 100 yds.—can be used. The speed at which rapid ferro paper receives the correct exposure is one minute per ft. lineal. Should it be desired to make prints from a number of smaller tracings of varying size, they can be fed by hand on to the photo paper as it travels to the contact rollers, and having passed between them and the contact plate they drop into a tray, ready for washing. The cost of the single type of machine is £70 for 30 in. tracings, and for the double machine £95. Messrs. Halden also exhibit a photo-printing, developing and drying machine which is of interest to firms requiring large numbers of copies.

Another exhibit of this class is the Shaw continuous rotary electric copying machine, made by Mr. Leonard Shaw, of 39, Victoria Street, S.W. This is of the old upright cylinder type with apparatus for lowering the lamp in the centre, but instead of being stationary the paper is passed around the cylinder, thus enabling prints of any length to be taken in one piece, by being simply fed into the apparatus. The cost of the 30 in. machine is £45. Only one lamp is required and a printing speed of 2 ft. per minute is attainable.

Lamps and Special Lights.

The varieties of arc lamps to be seen burning at the exhibition are multitudinous, but as we are not specially concerned with them we do not propose to go into any details of their construction. We would draw attention, however, to the flame lamps to be seen at several stands, and particularly to the "Orisflamme" arc lamps burning at the stand of Messrs. Oliver & Co., of Cambridge Place, Burridge Road, Woolwich, which lamps burn from forty to fifty hours with each trimming, are of low wattage consumption, and cost about the same for carbon as the ordinary open type arc lamp. The light given is a very pleasant warm yellow colour, far more agreeable than the usual cold-looking arc light. We would also draw attention to the well-known Jandus lamps on the stand of Messrs. Drake & Gorham, Ltd., and to the lamps of inverted type exhibited at the stand of Mr. G. Braulik, of 217-18, Upper Thames Street, E.C.; the latter being particularly suitable for lighting art schools and other buildings where a diffused light is most desirable.

Among the other lamps there are numerous novelties. The "Tantalum" electric glow lamp, possessing a filament of the rare metal tantalum instead of carbon, is in evidence at one or two stands. This lamp has its filament widely extended, and gives a better distribution of light than the ordinary lamp, and there is no blackening of the bulb. The makers say that the lamp is of high efficiency, and requires only half the current of an ordinary lamp of similar voltage and candle-power.

The "Osmi" lamp—the invention of von Welsbach—is shown by the General Electric Co. In this the filament is of osmium, and the makers claim for it that a saving of about 56 per cent. of current is effected, that the lamp has a longer life, and that the light is white and more effective than the ordinary lamp.

Another new light is the Bastian mercury vapour lamp, which is exhibited by Messrs. Rumney & Rumney, of 39, Victoria Street, Westminster. This is an enclosed arc lamp with mercury in place of carbon electrodes, and is said to burn for a very long time. The light, however, resembling moonlight, is not a pleasant one: and somewhat similar criticism applies to the "Linolight" lamps exhibited by the Linolight Co., of 25, Victoria Street, S.W. As the name implies, this lamp gives a line of light, and though certainly suitable for shop windows or similar purposes we hardly consider it a pleasant light for ordinary use. It is made in lengths from 1 in. to 8 ft. 6 ins., and costs 1d. per yard per hour for energy at 6d. per B.T. unit.

Another novelty is the Economical Turn-down lamp, exhibited by Messrs. Geipel & Lange, of Vulcan Works, St. Thomas's Street, S.E. This has two filaments, one as ordinary and the other a 1-c.p. filament. Arranged in the cap of the lamp is a switch operated by two cords. Thus when the light is desired to be turned down it is only necessary to pull one of the cords, and similarly to pull the other cord when the full light of the lamp is required.

Of the many imitation candle-lamps shown we can only say that we think they are rather a mistake, as electric light offers so



Pendant in antique copper with obscured glass



Two-light bracket, inlaid.

"EDISWAN" FITTINGS.

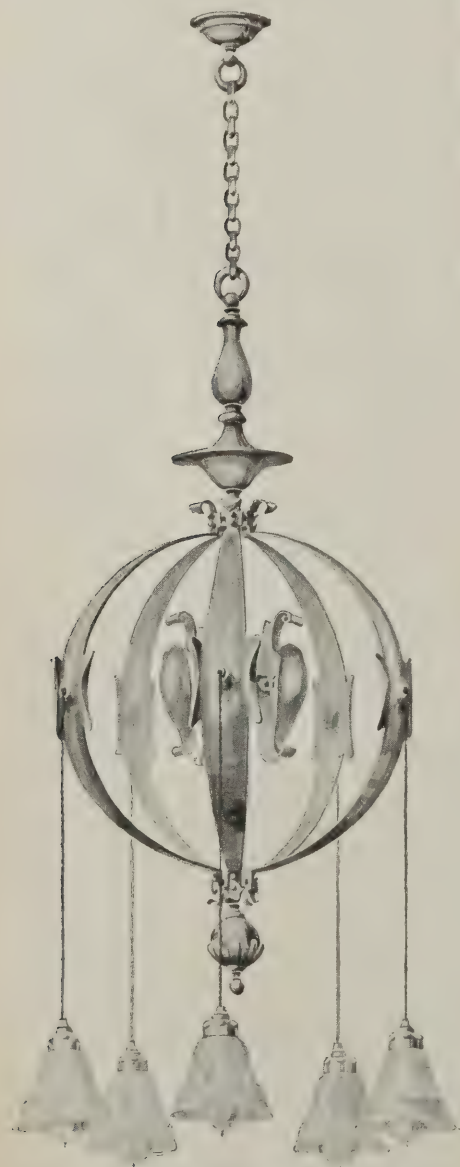
many possibilities of treatment particular to itself that it seems rather a misapplication to copy the old candlelight.

In referring to the lamps at the exhibition we cannot omit reference to the most interesting exhibits by Messrs. Robertson Electric Lamps, Ltd., and the Edison & Swan Co., both of whom have a number of girl operators at work, giving a practical exhibition of the various stages of lamp manufacture. The exhibit of the Edison & Swan Co. is especially good, and one which is watched with the keenest interest by every visitor.

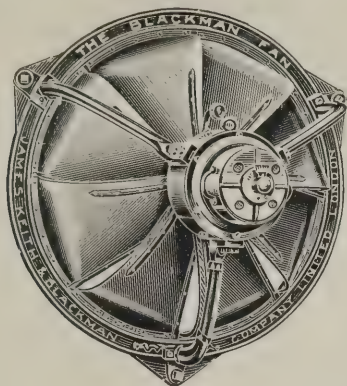
Electric-light Fittings.

There are so many delightful new ways in which electric light can be used that we are glad to see many of the makers have abandoned the old familiar types associated with gaslights, and on many of the stands some most artistic pendants and brackets are exhibited. It is of course impossible to attempt to describe these, as they need to be seen to be appreciated, but the accompanying illustrations serve to show what is meant. The Edison & Swan Co. have an exhibit comprising every variety of fitting; also the General Electric Co., who have a specially good show, as well as Verity's Ltd. and Mr. Albert C. Hands, of Snow Hill, E.C. Other makers, such as Messrs. Escare & Denelle, Ltd., of 129, Wardour Street, W., have gone back to the old periods—Louis XIV., XV., XVI., Empire, Georgian and Adam—for models, and certainly some of the exhibits are very effective, though we still consider that the more modern treatment is better.

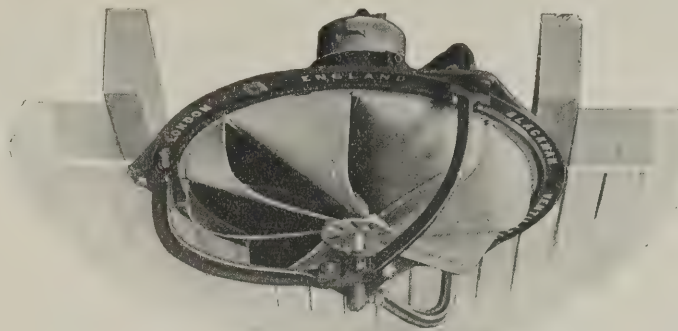
Electric light fittings on French models are also to be seen at the stand of the General Electric Co., who have made a speciality of replicas from the "Mobilier Nationale," two



FIVE-LIGHT ELECTROLIER BY GENERAL ELECTRIC CO., LTD.



Electric fan and motor combined.



Fan fixed to ceiling, the running weight and thrust being borne by anti-friction discs in close-ended bearing.

TYPES OF BLACKMAN ELECTRIC FANS FOR VENTILATING.

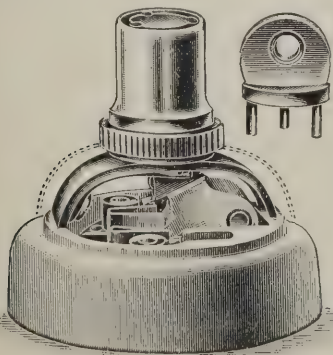
new showrooms at their headquarters in Queen Victoria Street having been specially designed and decorated to show these in position. The firm's catalogue offers quite a range of crystal fittings entirely modern in style and feeling; these are very delightful and fresh, the metal parts being complementary to the crystal, as opposed to the old style of glass electroliers—so cold and forbidding. Another speciality is the design and manufacture of wooden fittings, which are, for the most part, free from eccentricity. The pendants and electroliers shown by this firm are suspended by patent chains designed to successfully screen the flexible leads, without losing the simplicity and charm of the oval link chain.

Switches and Pushes.

The Edison & Swan Co. have an extensive exhibit of Tumbler switches. These are of the well-known tumbler type, and are very smooth in action. They are made in every possible variety, and with excellent finish. Another type of switch shown by this company is the button switch with wedge movement, which, by the simple motion of pushing the button, either cuts on or cuts off the current, thus effecting by one movement what has hitherto required two separate pushes. Their key switch for asylums, &c., is also interesting. We illustrate it below.

In the matter of neat and artistic pushes the exhibit of Messrs. Bonnell & Son, Ltd., of 58 and 60, Mortimer Street, Cavendish Square, W., is worthy of careful attention. These switches are of the most delightful design, especially some in Adam style, while a special exhibit is made of switches in a new material called Ivoride, which is non-flammable and can be produced in many attractive varieties.

Very artistic pushes and fittings are shown by Messrs. B. Dellagana & Co., Ltd., of Bromells Road, Clapham, these being in Kupron - Bronze—a process of electrically deposited copper adaptable to many requirements.



"EDISWAN" SWITCH OPERATED BY 3-PRONG KEY, FOR ASYLUMS, &c.

Telephones.

The telephone, now so established a feature of business life, has latterly been forcing its way into domestic use, and the architect is often required to provide a system extending throughout the various rooms of the house, while the same system of intercommunication is found to be of the greatest service in offices and other places. We draw attention therefore to the numerous house telephones to be seen at the exhibition. There is a very good one on the stand of the General Electric Co., consisting of a neat apparatus with a series of push-buttons by which it is possible to at once set up connection with any desired room, while on replacing the handle on the hooks the line is cut off and put into the normal position ready for a fresh call. Another of these useful wall instruments is shown by the Electric and Ordnance Accessories Co., Ltd., of Stellite Works, Birmingham. This company makes a "Homestead" set costing only 34s. and comprising two instruments, with hand sets, bell-pushes, &c., two dry cells and 30 yds. of wire, suitable for use between dining-room and kitchen, study and pantry, or from the private office to the clerk's office.

Electric Motors, Hoists, Fans, &c.

The number of electric motors in the exhibition is multitudinous, and we cannot possibly refer to them in detail. We can only mention that the use of such motors for driving mortar mills, and especially for hoisting materials on buildings, is very economical when current is available at a reasonable rate, and in this connection the motors are worthy of the attention of all builders and contractors visiting the exhibition. We notice that Messrs. Vickers, Sons & Maxim, Ltd., show a winch to lift 5 tons at the rate of 70ft. per minute with a 40-h.p. motor working at 220 volts continuous current; while other motors of a similar type are exhibited by the General Electric Co.

Messrs. Siemens Brothers & Co., Ltd., and Messrs. Crompton have specially extensive exhibits of motors of all sizes.

In the matter of fans, either belt-driven or direct-connected to motors, Messrs. James Keith & Blackman Co., of 27, Farringdon Avenue, have a good exhibit. Their well-known fans are of two types, induction or series, and can be adapted for continuous or alternating current. Special attention is directed to those which have motors combined with the fans, as they are very neat in design. These fans are invaluable for ventilating, cooling, heating, drying, &c.

A number of fans are shown by the Sturtevant Engineering Co., of 147, Queen Victoria Street, E.C. There is nothing particularly new in their design, and we can do no more than draw the attention of visitors to them. This firm has executed a great deal of ventilating work, and in this connection

their exhibit is particularly interesting to architects.

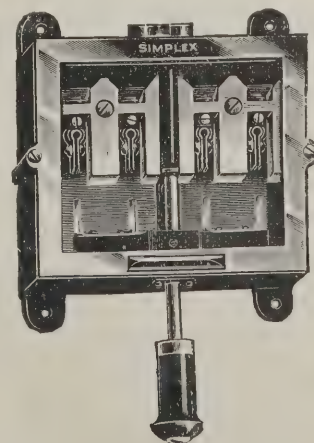
A novelty in the way of fans is shown by the Electric and Ordnance Accessories Co., Ltd., of Cheston Road, Aston, Birmingham. This fan has a pocket in which a sponge saturated with deodorant, scent, &c., is placed and through which the air is delivered. This fan is useful therefore for hospitals, &c., in supplying disinfected air or for delivering perfumed or deodorized air to ordinary rooms.

An exhibit of interest to architects is the Wade Jones "oil-dynamo"—a combined oil-engine and dynamo (the latter of "Witton" type, made by the General Electric Co., Ltd.). This is most useful for country-house lighting, being always ready for work, and very neat and compact. It is exhibited by Messrs. A. P. Wright & Co., of 60, Queen Victoria Street, E.C.

The use of electricity in dairy and farm premises is shown by Messrs. Drake & Gorham, Ltd., of 66, Victoria Street, who exhibit a three-throw pump, dairy apparatus and chaff-cutter electrically driven.

Lifts.

We are surprised to see so few exhibits of electric lifts at the exhibition. Several well-known makers, such as Messrs. Waygood and the Otis Co., are absent. The Easton Lift Co., Ltd., have erected two lifts from the floor of the hall to the gallery, and these can be examined as full-sized specimens. They are direct-coupled passenger lifts, each carrying twelve persons (or 18 cwts.) through a height of 20ft. at a speed of 150ft. per minute, and each is fitted with the firm's latest type of car switch controller. At one or two stands small models of lifts are shown, as, for instance, that of the Auto-Controller and Switch Co., of Vienna Road, Bermondsey, S.E., who show their patent press-button automatic lift. This can be brought to any floor by simply pressing the button, and can



"SIMPLEX" WATER-TIGHT MAIN SWITCH.



SIMPLEX CONDUIT BENDING MACHINE.

be operated inside the cage in a similar automatic manner. No attendant is required to work the lift, and it is therefore of particular service in buildings where economy has to be studied, or where visits are so infrequent or at such unusual hours that the attendance of a lift man would be undesirable. Stigler press-button lifts are also shown by Messrs. J. E. Spagnoletti & Co., of Goldhawk Works, W.

Wiring.

In wiring, the old system of wooden casings has now gone out of favour and its place has been taken by steel conduit, which is very much neater in appearance, safer and altogether better.

The Simplex Steel Conduit Co., Ltd., of Birmingham and London, have a very attractive stand on which all the applications of their system are shown. Readers are already conversant with these, and there is no occasion now to refer to them in detail. Suffice to say that every kind of fitting is exhibited, as the above illustration of the stand indicates. The only detail which we now mention is the Simplex conduit bending machine. This is a very convenient and portable tool, comprising a wooden lever, a hinge link and a bending mould with two grooves of different radii. While being bent the tube lies well in the groove of the mould, and takes up the desired bend without flattening or injury.

Union Papirsteel Insulated Conduit is shown by the General Electric Co., Ltd. The method adopted in the manufacture of this conduit is entirely different to that previously employed, as the tubing is drawn on to the insulated lining, instead of the insulation being expanded into the tube. This ensures the lining being held securely in place and avoids the possibility of its being drawn out when wiring.

For temporary wiring the system of Messrs. Simmonds Brothers, Ltd., of Newton Street, Holborn, W.C., is especially interesting to builders. It is a curious fact that the temporary wiring of rooms, &c., has very often to be done so hurriedly that the work is not so good as it should be, and consequently the risks of fire are greater; moreover, it is probable that a temporary building will be much more inflammable than a permanent building would be; it is therefore very

important that the wiring should be such as to avoid any risks of fire or shock. Messrs. Simmonds employ a wire enclosed with rubber and wound round with flexible steel tube of $\frac{3}{16}$ in. diameter. This is made up in convenient lengths, and a patent mechanical coupling is fixed at each end, so that any desired length can be had, and fittings connected where desired. One particular merit of the system is that the tubing forms a continuous metal conductor which can be connected to earth; thus an accidental shock can hardly be possible. We understand that the firm do a large business in hiring out their leads and fittings for temporary wiring, but contractors frequently requiring electric light on buildings would of course have their own installation.

Another wiring novelty to be seen at the exhibition is the "dead-wire" system of Mr. A. Blackmore, 5, Montpelier Street, Brompton Road, S.W. In this system there are no "live" wires except those in actual use for lighting or power, and thus the risk of fire is reduced. With the ordinary system a faulty joint may be the cause of fire, whether the light is on or off, by reason of short circuiting, whereas in this new system there is one continuous conductor for every light, both lead and return, without a joint from the light to the switch at the source of supply. The light is put on or off by push-button switches very neat and small, in comparison with which the usual tumbler switches are extremely bulky: and this is not the least interesting feature of the system.

In conclusion, we may say that the exhibition is open from 10 to 10 till October 21st. A small loan section has been arranged in connection with it, and a series of lectures is being given by various authorities. On Tuesday last week Colonel Crompton read a paper on the "Development of the Use of Electric Motors," referring especially to their use in the house; while on Friday Mr. Swinburne read a paper on "Domestic Electric Lighting." Other papers will be:—Wednesday, October 11th, "Electric Heating," by Mr. Dowsing; Friday, October 13th, "Electric Telegraphy," by Mr. A. Martin; Tuesday, October 17th, "Electric Arc Lighting," by Mrs. Ayrton; Wednesday, October 18th, "Electric Traction," by Mr. W. M. Mordey; and Friday, October 20th, "Telephones," by Mr. F. Gill.

Current Market Prices.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	12	0
Clover, best	per load	3	12	0	4	0	0
Hay, good	do.	3	3	0	3	10	0
Sainfoin mixture	do.	3	7	0	3	15	0
Straw	do.	1	10	0	1	16	0

OILS AND PAINTS.

Castor Oil, French	per cwt.	1	3	11	1	6	3
Colza Oil, English	do.	1	3	0	—	—	—
Copperas	per ton	2	0	0	—	—	—
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate	per ton	16	0	0	—	—	—
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels	per cwt.	0	16	3	—	—	—
Petroleum, American	per gal.	0	0	6 $\frac{3}{4}$	0	0	6 $\frac{3}{4}$
Do. Russian	do.	0	0	5 $\frac{1}{2}$	0	0	5 $\frac{1}{2}$
Pitch	per barrel	0	8	0	—	—	—
Shellac, orange	per cwt.	8	19	0	9	1	0
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0	1	5	6
Tar, Stockholm	per barrel	1	5	0	—	—	—
Turpentine	per cwt.	2	9	9	—	—	—

METALS.

Copper, sheet, strong	per ton	85	0	0	—	—	—
Iron, Stads., bar	do.	6	2	6	8	0	0
Do. Galvanized Corrugated sheet	do.	11	5	0	12	0	0
Lead, pig, Soft Foreign	do.	14	11	3	—	—	—
Do. English common brands	do.	14	17	6	—	—	—
Do. sheet English, 3lb. per sq. ft. and upwards	do.	15	0	0	—	—	—
Do. pipe	do.	16	0	0	—	—	—
Nails, cut clasp, 3in. to 6in.	do.	9	5	0	—	—	—
Do. floor brads	do.	9	0	0	—	—	—
Steel, Stads., Girders and Angles	do.	5	7	6	5	12	6
Do. Mild bars	do.	6	0	0	6	5	0
Tin, Foreign	do.	148	15	0	149	5	0
Do. English ingots	do.	150	0	0	151	0	0
Zinc, sheets, Silesian	do.	29	10	6	—	—	—
Do. do. Vieille Montagne	do.	29	12	6	—	—	—
Do. Spelter	do.	27	12	6	—	—	—

TIMBER.

Soft Woods.

Fir, Dantzic and Memel	per load	2	12	6	5	0	0
Pine, Quebec, Yellow	do.	4	0	0	7	10	0
Do. Pitch, American	do.	3	3	0	5	0	0
Laths, log, Dantzic	per cu. fath.	4	0	0	6	0	0
Deals, Lulea, and Nederkalix, Yellow, 2nd, 4x9	per std.	9	0	0	—	—	—
Do. Nederkalix, Yellow, 2nd, 3x5	do.	7	5	0	—	—	—
Do. do. do. 2nd, 3x5	do.	7	10	0	—	—	—
Do. do. do. 3rd, 3x4	do.	6	15	0	—	—	—
Do. Skelleftea, Yellow, 1st, 3x4	do.	8	10	0	—	—	—
Do. do. do. 2nd, 4x6	do.	8	10	0	—	—	—
Do. do. do. 3x4	do.	8	5	0	—	—	—
Do. do. do. 5th, 4x9	do.	9	0	0	—	—	—
Do. St. Petersburg, Yellow, 1st, 3x9	do.	10	15	0	—	—	—
Do. do. do. Unsorted, 3x11	do.	7	10	0	—	—	—
Do. do. do. 3rd, 3x7	do.	7	15	0	—	—	—
Do. do. White, Unsorted, 3x9	do.	9	0	0	—	—	—
Do. do. do. 2 $\frac{1}{2}$ x7	do.	7	10	0	—	—	—
Do. Mesane, White, 2nd, 3x11	do.	10	0	0	10	5	0
Do. Archangel, Yellow, 4th, 3x11	do.	7	15	0	—	—	—
Do. do. do. 5th, 3x9	do.	6	10	0	—	—	—
Do. do. do. Unsorted, 3x10	do.	7	15	0	—	—	—
Do. Montreal, Red Pine, 1st, 3x9	do.	12	15	0	—	—	—
Do. do. do. 2nd, 3x11	do.	9	10	0	—	—	—
Do. Räfsö, Yellow, 1st, 3x9	do.	14	10	0	—	—	—
Do. do. do. 2nd, 3x9	do.	12	5	0	—	—	—
Do. do. do. 4th, 3x7	do.	8	0	0	—	—	—
Do. do. do. 2 $\frac{1}{2}$ x8	do.	8	0	0	—	—	—
Do. do. do. 2 $\frac{1}{2}$ x7	do.	8	5	0	8	10	0
Do. do. White, 4th, 2 $\frac{1}{2}$ x7	do.	7	15	0	—	—	—
Do. Ljusne, Yellow, 3rd, 3x8	do.	10	10	0	—	—	—
Do. Oxelosund, Yellow, 2nd, 3x7	do.	7	10	0	—	—	—
Do. do. do. 3x4	do.	7	10	0	—	—	—
Do. Swartvik, Yellow, 3x7	do.	6	2	6	—	—	—
Do. Sikea, Yellow and White, 3x5	do.	4	0	0	—	—	—
Do. do. do. 3x4 $\frac{1}{2}$	do.	4	0	0	—	—	—
Do. Petschora, Yellow, 3rd, 2 $\frac{1}{2}$ x7	do.	9	15	0	9	15	0
Battens, all kinds	do.	6	13	0	13	0	0
Flooring Boards rin. prepared, 1st...	per square	0	9	9	0	10	9
Do. 2nd	do.	0	8	6	0	10	0
Do. 3rd, &c.	do.	0	8	9	0	9	6

HARD WOODS.

Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick	do.	2	0	0	4	5	0
Do. Quebec do.	do.	2	5	0	4	10	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	8 $\frac{1}{2}$	—	—	—
Do. Honduras	do.	0	0	3 $\frac{1}{2}$	0	0	4
Do. Tobasco	do.	0	0	5	—	—	—
Whitewood, American, logs	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0

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Modern and Antique Fire Grates.

Carron Company have the finest, most artistic, and most extensive selection of Fireplace Furnishings in existence. Some of these are taken from originals carved by famous Artists at Carron Works nearly a Century-and-a-half ago.

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of
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harmonize with any
scheme of
Room Decoration.



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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberdare.—Accepted for the erection of additional classrooms, new cloakrooms, &c., and for alterations to Capcnoch mixed schools, for the Education Committee. Messrs. J. Llewellyn, Smith & Davies, architects, 7, Victoria Square, Aberdare:—

A. J. Colborne, Swinton ... £1,490 16 0

Bodmin.—For the erection of eighteen workmen's dwellings in St. Mary's Road, for the Town Council:—

J. Cockerell, Plymouth ... £3,450

Pethick Brothers, Plymouth ... 3,444

E. Harris, Bodmin ... 3,065

Ham Brothers, Bodmin ... 2,880

J. Buscombe & Sons, Bodmin ... 2,646

Hobbs, Plymouth ... 2,599

J. Brown & Son, Bodmin ... 2,597

Trehane, Liskeard ... 2,475

Bennett, * Cawsand, Plymouth ... 2,370

* Accepted.

Croydon.—For the erection of four shops, &c., for Mr. E. Clare. Mr. S. C. Hart, architect, 22, Philpot Lane, London, E.C.4:—

Cordell & Sons ... £2,777

H. E. Buckingham, Ltd. ... 2,100

Hall & Jacobs ... 2,035

W. Roberts ... 2,000

C. H. Wallis & Co. ... 1,950

W. Brooks & Co. ... 1,745

G. Buxton ... 1,470

M. Wallis ... 1,467

Colchester.—For the erection of new Council schools at Myland. Mr. C. E. Butcher, M.S.A., architect, 3, Queen Street, Colchester:—

Contract No. 1.—School buildings.

W. Manders,† Leyton ... £4,768 13 11

H. W. Gladwell, Walton-on-Naze ... 4,353 0 6

R. Beaumont ... 4,250 0 0

H. Everett & Son ... 4,250 0 0

Oak Building Co. ... 4,190 0 0

C. Roper, Ipswich ... 4,052 0 0

G. Grimwood & Sons, Sudbury ... 4,050 0 0

G. Dobson & Son ... 3,987 0 0

A. Suckling & Co., Halstead ... 3,880 0 0

T. J. Ward ... 3,850 0 0

J. McKay, Clacton-on-Sea ... 3,650 0 0

W. Chambers* ... 3,650 0 0

* Accepted.

† Nos. 2 and 3 estimates included.

Croydon.—For proposed shop and premises on site of 36, South End, for Mr. W. Chiesman. Mr. William C. Poole, architect, 62, Belleville Road, Wandsworth Common, S.W. Quantities by Mr. G. Cooper Poole, 61, High Street, Southampton:—

T. Pearce, Thornton Heath ... £3,430 0 0

Nick & Co., Clapham Junction ... 3,396 3 0

E. Wallis, Sevenoaks ... 3,323 5 5

J. & C. Bowyer, Norwood ... 3,275 0 0

F. Webster, Peckham Kye ... 3,274 0 0

W. H. Baldwin, Croydon ... 3,209 9 0

C. Marriott, Caterham Valley ... 3,200 0 0

F. & G. Foster, Norwood Junction ... 3,146 0 0

Turtle & Appleton, Clapham Junction ... 3,135 0 0

H. Bacon & Son, Thornton Heath ... 3,097 0 0

W. Smith & Sons, Croydon ... 3,085 0 0

B. E. Nightingale, Albert Embankment ... 3,081 0 0

W. H. Hyde, Norwood Junction ... 3,046 0 0

S. Page & Son, Croydon ... 2,999 0 0

G. Wales & Co., South Hackney ... 2,975 10 0

Harris & Co., Barnsbury, N. ... 2,975 0 0

J. Barker & Co., * Kensington ... 2,959 0 0

Gathercole Brothers, Norbury ... 2,950 0 0

* Accepted subject to revision.

Headington.—Accepted for brickwork to greenhouses at "Hillside," Headington, near Oxford, for Mr. R. Kent Tucker. Mr. Frank Mountain, architect, 13 and 14, Cornmarket Street, Oxford:—

F. Capel ... £180 10 0

Heysham.—For the erection of new Council offices, caretaker's house, stabling, &c., for the Urban District Council:—

All trades.

R. Kitchen ... £2,715 2 7

J. Hatch & Sons, Lancaster ... 2,500 0 0

W. Parkinson, Lancaster ... 2,432 10 11

D. Hinchcliffe & Co. ... 2,394 5 6

J. H. Brear, Morecambe ... 2,248 15 3

R. Thompson, Lancaster ... £2,248 9 9

J. Edmondson & Co., Morecambe ... 2,224 17 10

S. H. Cross & Co. ... 2,139 10 10

J. S. Jackson ... 2,138 15 0

Bakes & Overend ... 2,093 4 3

Excavator, mason, bricklayer and drainer's work.

W. Haworth ... £1,498 6 9

R. Kitchen ... 1,451 0 11

W. Parkinson ... 1,418 0 0

R. L. Dilworth, Lancaster ... 1,413 3 4

J. Hatch & Sons ... 1,391 0 0

J. L. Tyson, Lancaster ... 1,381 14 7

W. W. Stoneham, Lancaster ... 1,372 5 3

D. Hinchcliffe & Co. ... 1,335 6 2

R. Thompson ... 1,233 18 9

Gillard & Martin, Bradford ... 1,213 12 2

J. H. Brear ... 1,213 12 2

T. Totty, Bradford ... 1,170 0 0

Bakes & Overend ... 1,160 0 0

J. Edmondson & Co. ... 1,155 1 10

S. H. Cross & Co. ... 1,135 10 6

J. Jackson* ... 1,134 10 6

* Accepted. [Rest of Heysham.]

Kenilworth.—For the erection and completion of a new reformatory school for girls, lodge, laundry, &c., for the Committee of the Warwickshire Reformatory Institutions. Mr. C. M. C. Armstrong, architect 5, High Street, Warwick:—

J. H. Cashmore & Sons ... £6,130 0 0

E. Smith & Son ... 5,999 0 0

R. Bowen ... 5,600 0 0

F. Davis ... 5,550 0 0

T. Broad, Ltd. ... 5,391 0 0

Parnell & Son ... 5,374 7 0

J. Barnsley & Sons ... 5,348 0 0

G. F. Smith & Sons ... 5,263 0 0

Kelly & Son ... 5,060 15 11

C. Hope, Berkswell* ... 4,942 0 0

W. J. Wittall & Son ... 3,269 0 0

* Accepted.

Lydney.—For the erection of an elementary school, for the County Education Committee. Mr. M. H. Medland, county architect, 15, Clarence Street. Quantities by Messrs. Vale & Kingsford, surveyors, George Street, Gloucester:—

J. Gurney, Gloucester ... £3,531 0 0

W. Jones, Gloucester ... 3,453 0 0

T. Griffiths, Lydney ... 3,385 0 0

H. Smith, Kidderminster ... 3,321 0 0

A. Estcourt & Sons, Gloucester ... 3,232 0 0

J. Perkins & Sons, Bristol ... 3,225 0 0

Jarrett & Fisher, Newport ... 3,180 0 0

H. Woolley & Son, Cinderford ... 3,031 0 0

A. J. Colbourne, Swindon ... 2,921 12 0

Orchard & Peir, Bowbridge, Stroud ... 2,880 0 0

I. Byard & Sons,* Gloucester ... 2,819 0 0

* Accepted.

Continued on p. xiii.

The Edison & Swan United Electric Light Company, Limited,

36 & 37, QUEEN STREET, CHEAPSIDE, LONDON, E.C.

And at Birmingham, Belfast, Cardiff, Dublin, Dundee, Glasgow, Hull, Leeds, Liverpool, Manchester, Newcastle-on-Tyne, Sydney, N.S.W.

OLYMPIA 1905

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THE "ROYAL EDISWAN" LAMP.

THE "RADIO-LITE."

THE TELAUTOGRAPH DEMONSTRATION.

TENDERS—cont. from p. xi.

London, N.—For alterations and additions to the Alexandra Park Tavern, High Road, Wood Green. Messrs. Warran & Stupart, architects and surveyors, 78, Grand Parade, Harringay, N. :—

H. Knight & Son	£1,823
A. Porter	1,695
Green & Smith	1,597
Oliver & Co.	1,593
Swire & Co.	1,575
C. Hale & Co.	1,425

* Accepted subject to modification.

Marston.—Accepted for the erection of a cottage at Marston, near Oxford, for Mr. J. H. Vallis. Mr. Frank Mountain, architect, 13 and 14, Cornmarket Street, Oxford :—

F. Capel	£340 10 0
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Newcastle-on-Tyne.—For alterations, &c. to kitchen, &c., at the City Lunatic Asylum, for the Lunatic Asylum Visiting Committee. Mr. F. H. Holford, city architect. Quantities by Mr. J. Savage, 1, Mosley Street, Newcastle-upon-Tyne :—

General building work.

S. Fenwick & Co.	£4,037 4 5
J. Nicholson	3,701 10 0
Middlemiss Brothers	3,688 18 7
J. Craven	3,518 18 0
Franklin & Son	3,400 0 0
S. Buy	3,389 0 5
W. Jackson	3,385 0 5
W. Worley, junr.	3,358 3 0
S. F. Davidson	3,295 0 0
R. Veitch & Sons	3,293 9 1
J. Oliver & Sons	3,270 0 0
W. C. Fleck	3,233 14 0
Elliott Brothers	3,227 7 9
G. H. Mauchlen	3,143 10 6
J. C. Hope	3,115 15 1
E. T. George	3,000 0 0
W. Nicholson	2,900 14 9

Cooking apparatus.

J. Slater & Co.	1,163 2 0
Benham & Sons	1,135 0 0
J. Simpson & Co.	1,016 0 0
W. Summerscales & Sons	966 10 0
H. Walker & Sons	874 10 0
Ashwell & Nesbit	745 10 0
Barford, Perkins & Co.	745 0 0
T. Bradford & Co.	659 0 0

Oxford.—For the erection of a pair of houses in Lotherbury Road, for Mr. Francis J. Andrews. Mr. Frank Mountain, architect, 13 and 14, Cornmarket Street, Oxford. Quantities by the architect :—

Organ Brothers	£2,170 0 0
Brucker Brothers	2,116 0 0

J. Wooldridge	£1,922 0 0
J. Simms & Sons*	1,890 10 0

* Accepted.

Oxford.—For shop fittings to new business premises, St. Aldates Street, for the Oxford Co-operative and Industrial Society, Ltd. Mr. Frank Mountain, architect, 13 and 14, Cornmarket, Oxford :—

Bartlett & Son, Bristol	£139 3 0
W. Gray,* Oxford	98 10 0

* Accepted.

Oxford.—For the erection of a pair of houses at Lonsdale Road, for Mr. Francis Twining. Mr. F. Mountain, architect, 13 and 14, Cornmarket Street, Oxford :—

J. Simms & Sons	£1,118
T. H. Kingerlee & Sons	1,070
S. Hutchins & Son	1,020
W. W. Gray	980
N. Capel & Sons*	900

* Accepted.

[All of Oxford.]

Oxford.—For the erection of six houses in Lonsdale Road, for Mr. F. Twining. Mr. Frank Mountain, architect, 13 and 14, Cornmarket Street, Oxford :—

J. Simms & Sons	£3,098
T. H. Kingerlee & Sons	3,060
S. Hutchins & Son	2,980
W. Gray	2,740
N. Capel & Sons*	2,570

* Accepted.

[All of Oxford.]

Portsmouth.—For pulling down and rebuilding "The Still" public-house, Portsmouth, for Messrs. Pike, Spicer & Co., brewers. Messrs. Rake & Cogswell, architects, Landport :—

Croad	£1,230
Crockerell	1,208
Salter	1,187
Jones	1,187
Corke	1,187

[All of Portsmouth.]

Spennymoor.—For alterations and additions to Rosa Street School, for the Durham County Council. Mr. W. Rushworth, F.R.I.B.A., architect, County Education Offices :—

G. T. Manners, Durham	£2,380 0 0
E. Rutherford, Cockfield	2,162 14 5
H. C. Howe, Park Road, West	
Hartlepool	1,910 0 0
Mathew, Robs, Draper & Sons,	
Leamside	1,855 8 7
J. G. Bradley, Durham	1,808 14 0
W. Foster, Pelaw-on-Tyne	1,765 0 0
Hetherington & Robson, Coundon	1,759 0 0
W. Hope & Sons, Coundon	1,745 15 0
R. Telfer, Spennymoor	1,718 10 0
G. H. Bell,* Bishop Auckland	1,712 0 0

* Accepted.

Worthing.—For the improvement and enlargement of the Corporation bath at Heene :—

W. W. Sandell, Worthing	£2,250 0 0
J. H. Lelliott, Worthing	2,229 9 0
R. Cook & Sons, Crawley	2,220 0 0
Peerless, Dennis & Co., Eastbourne	2,168 0 0
W. J. East, Worthing	2,164 0 0
Rowland Brothers, Horsham	2,149 0 0
A. Duffield, West Tarring	2,145 0 0
Longley & Co.,* Crawley	2,089 0 0

* Recommended for acceptance.

Wrexham.—For the erection of a public library, for the Town Council :—

T. G. Huxley, Malpas, Cheshire	£5,195
J. B. Woolley	4,500
Lewis Brothers	4,315
T. L. Davies, Rhos, Ruabon	4,275
F. Matthews, Nantwich	4,184

Dryland & Preston, Littleborough, Lancs

Davies Brothers

T. Jones

Hughes & Stirling, Liverpool

R. Rowley,* Gresford

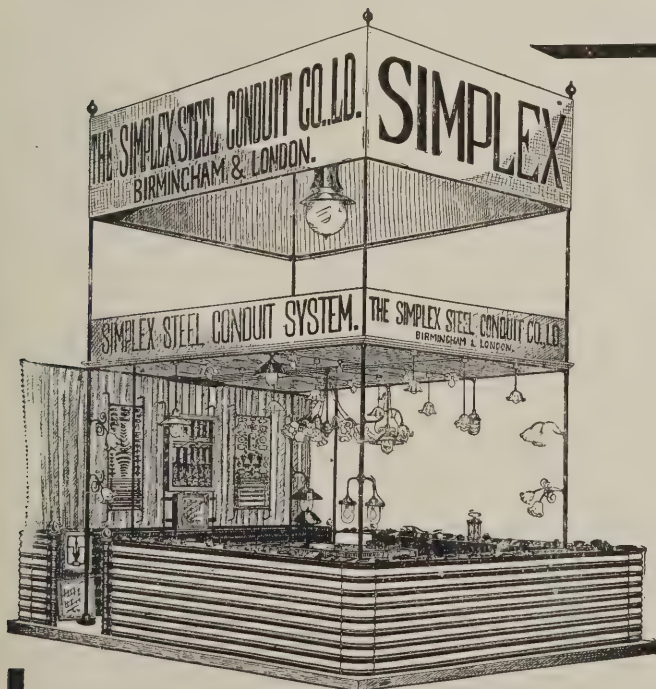
[A.—Less allowance for old materials of cottages to be pulled down. Rest of Wrexham.]

* Accepted.

The ancient Chapel of St. Nicholas, within Carisbrooke Castle, which was reopened and dedicated by the Bishop of Winchester last week, has been restored as a national memorial of Charles I., who was imprisoned within the walls of the castle. The work has been carried out under the direction of Mr. Percy Stone, F.S.A., F.R.I.B.A.

The Forum Excavations: What Comm.

Boni is doing.—Commendatore Boni, the director of the Forum excavations, is repairing the Arch of Septimius Severus at Rome, which badly needed attention; he is covering the *lapis niger* with a proper roof; and he intends to proceed at once with the exploration of the site of Domitian's horse. He has had to suspend further operations on the Clivus Palatinus until the Ministry of Education has made up its mind whether it wishes the Forum and the Palatine to be united.



AT OLYMPIA

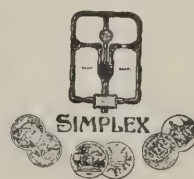
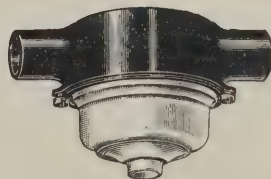
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R. H. BARRETT,
Clerk.

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Dated this 30th September, 1905.

HENRY HUMPHRIS,
Clerk to the Council.
Council Offices,
Hendon, N.W.

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"	12	Darwen—Warehouse, &c....	Paper Mills-Co. ...	Engineer's Office, Darwen Mill, Darwen.
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"	12	Aberdeen—Sheds, &c. ...	Royal Northern Agricultural Society.	R. R. Ross, Secretary, Balmoral Buildings, 67-71 Green, Aberdeen.
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"	16	London, S.W.—Baths ...	Borough Council ...	Council House, East Hill, Wandsworth, S.W.
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"	18	Hammersmith—New Baths ...	Council ...	H. Thompson, Town Clerk, Hammersmith.
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"	17	Nottingham—Bridge ...	Water Committee ...	Water Engineer, St. Peter's Church-side, Nottingham.
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"	18	Carshalton—Materials ...	Urban District Council ...	W. Willis Gale, Surveyor to the Council, Carshalton.
"	19	Southend-on-Sea—Making-up ...	Town Council ...	E. J. Elford, Borough Surveyor, Southend-on-Sea.
"	23	Barking—Private Street Works ...	Urban District Council ...	C. F. Dawson, Surveyor, Public Offices, Barking.
SANITARY :				
Oct.	20	Stratford-on-Avon—Sewerage Works ...	Rural District Council ...	Willcox & Raikes, Engineers, 63 Temple Row, Birmingham.
Nov.	1	Wembley—Sewers ...	Urban District Council ...	W. Bagshaw, Clerk, Public Offices, Wembley.
TIMBER :				
Oct.	11	Edgware—Deal Ends ...	Guardians ...	F. J. Seabrooke, Clerk, Union Offices, Edgware.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Oct. 16	Preston—School	£50, £30 and £20	—	Director of Education, Education Offices, Preston.
" 17	Deptford—Mortuary and Coroner's Court	10 and 10 guineas	—	V. Orchard, Town Clerk, Town Hall, Deptford.
" 20	Bridlington—Concert Hall	35 and 20 guineas	—	A. E. Matthewman, Town Clerk, Bridlington.
Nov. 4	Maesteg—Chapel	—	—	W. Job, Llynir Lodge, Maesteg, Wales.
" 4	Greenwich—Library	£25, £15, £10	—	F. Robinson, Town Clerk, Greenwich.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

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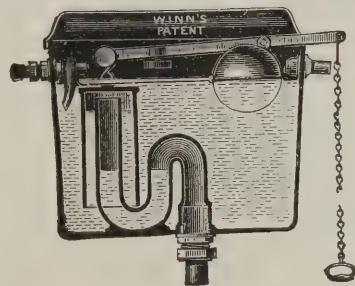
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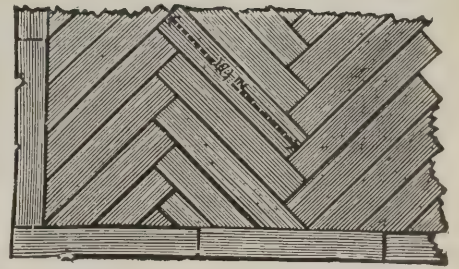
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(See displayed Advt. in issue for October 4, p. ii.)

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Bankruptcies.

DURING THE WEEK ending October 6th sixteen failures in the building and timber trades in England and Wales were gazetted.

J. SHATTOCK, builder, Newport. Deficiency £1,379.
J. G. W. BONE, builder, Leicester. Liabilities £1,358; assets £572.

C. W. GILLING, builder, Forest Gate and Sheerness. Adj. Sept. 25th.

W. E. CAPON, builder and contractor, Manningtree. Liabilities £1,172; assets £469.

J. J. MULLITT, builder and contractor, Dudley. P.E., Dudley C.C., Oct. 13th, at 11.

J. D. HODKIN, joiner and builder, Sheffield. Adj. Sept. 27th.

D. THOMAS, builder and contractor, Cardiff. Adj. Sept. 22nd.

J. T. BROWN, builder, Nottingham. Liabilities £579; assets £120.

C. GIMSON, builder and contractor, 23, Lawrence Lane, E.C. Unsecured debts £4,114; fully secured £26,588; assets estimated at £3,473.

P. NICKELLS, plumber, Totnes. First meeting, O.R.'s Plymouth, Oct. 12th, at 11. P.E., East Stonehouse, Town Hall, Oct. 12th, at 12.

R. TAVENER, builder, Forest Gate. First meeting, London Bankruptcy Court, Oct. 12th, at 11. P.E., same, Nov. 7th, at 11.50.

A. WITCOMB, painter and decorator, Bristol. First meeting, O.R.'s, Bristol, Oct. 11th, at 11.30. P.E., Bristol Guildhall, Nov. 17th, at 12.

G. SWINNERTON, builder and contractor, Aintree, Liverpool. First meeting, O.R.'s, Liverpool, Oct. 11th, at 12. P.E., Liverpool C.C., Oct. 12th, at 11.

J. G. W. BONE, builder, Leicester. First meeting, O.R.'s, Leicester, Oct. 11th, at 12. P.E., The Castle, Leicester, Oct. 20th, at 10.

T. NIXON, builder, London, E.C. First meeting, Bankruptcy Court, Oct. 11th, at 11. P.E., same, Nov. 12th, at 12.

W. EBDON, painter, Newbiggin-by-the-Sea (late Hirst). First meeting, O.R.'s, Newcastle-on-Tyne, Oct. 11th, at 11.30. P.E., Newcastle C.C., Oct. 19th, at 11.

C. OWEN, architect and surveyor, Walsall. First meeting, O.R.'s, Wolverhampton, Oct. 11th, at 11. P.E., Walsall C.C., Oct. 20th, at 11.30.

F. J. REEKS, plumber, Barnes. First meeting, 24, Railway Approach, London Bridge, Oct. 11th, at 11.30. P.E., Wandsworth C.C., Oct. 19th, at 12.

H. BOOR, plumber, Aston. First meeting, 191, Corporation Street, Birmingham, Oct. 13th, at 12. P.E., Birmingham C.C., Nov. 15th, at 2.

J. W. CALVERT, painter and decorator, Starbeck and Harrogate. First meeting, O.R.'s, York, Oct. 12th, at 2.30. P.E., York Courts of Justice, Nov. 3rd, at 11.

A. POLSUE-BURROW, builder, Bradford. First meeting, O.R.'s, Bradford, Oct. 13th, at 3. P.E., Bradford C.C., Oct. 25th, at 10.

Coming Events.

Thursday, October 12.

ROYAL INSTITUTE OF PUBLIC HEALTH.—Harben Lecture by Prof. T. Oliver, at 5 p.m.

INSTITUTE OF SANITARY ENGINEERS.—Visit to Chelsea Electricity Generating Station.

CARPENTERS' COMPANY.—Prof. D. S. Capper, of King's College, on "Sites: Wet and Dry Foundations," &c., Carpenters' Hall, London Wall, at 7.30 p.m.

MANCHESTER SOCIETY OF ARCHITECTS.—Special General Meeting at 6.45 p.m.

Friday, October 13.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Annual Dinner in Newcastle.

Saturday, October 14.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—General Meeting at 2 p.m.

Monday, October 16.

NORTHERN ARCHITECTURAL ASSOCIATION.—Visit to Edinburgh Architectural Association's Exhibition.

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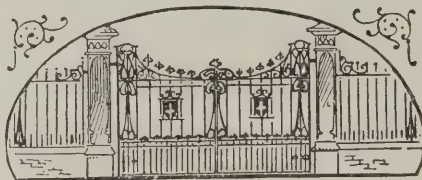
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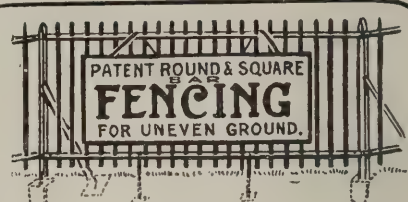
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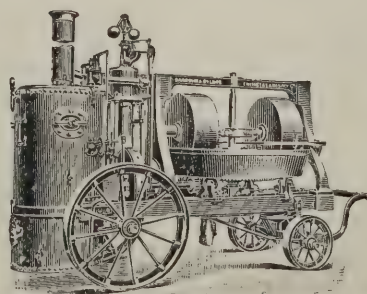
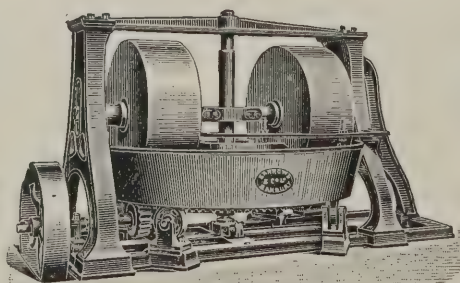
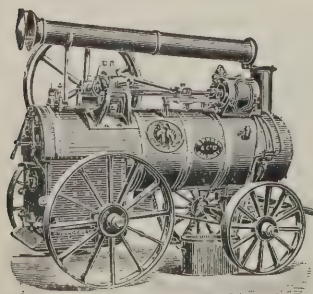
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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

October 18, 1905. Vol. 22, No. 558.

6, Great New Street, Fetter Lane, E.C.

Summary.

Earl Carrington says he has built forty-three new labourers' cottages on his estate at an average inclusive cost of £156 13s. per cottage, and he offers to let any landowner or land agent see the plans and specifications. —The cheap cottages exhibition closed on Saturday. (Page 220.)

The knowledge of the strength of brickwork is unsatisfactory, and new tests ought to be undertaken. No adequate theory can be attempted at present, as the existing tests were unscientifically performed. (Page 228.)

In taking levels when developing an estate it is as well to put in stumps about every two chains apart. A good plan is to have the stumps about 2ft. long, driven until the tops are level with the surface of the ground; then to excavate round the stump about 1ft. diameter and 6ins. deep, and fill in with cement-concrete level with the top of the peg. (Page 219.)

The excavations in connection with the shoring-up of the exterior of the east end of Winchester Cathedral have revealed a serious fracture in the walls, which widens as it descends. £2,000 is needed immediately to repair the damage. (Page 230.)

Ayr Bridge has been respited for four months to enable those interested in its preservation to provide the means of restoration and also to satisfy the Ayr Council that the methods they propose will be such as to ensure permanency. (Page 230.)

The general tone of the London timber trade during September was good; the volume of trade improved, and a confident feeling as to the future continues to gain ground. Reports from the Liverpool market speak of greater activity, due to the more settled condition of trade after the holiday season. (Page 223.)

There are instances whereterne plates have been known to last on a roof 100 years. There is a church in Vermont, U.S.A., whose steeple was covered with iron plates coated with pure tin in 1816, and it had never been painted up to 1903—eighty-seven years on a roof. (Page 227.)

A detailed description of the design and working-out of reinforced concrete lintels appears on p. 221.

Plans for the Usher Hall at Edinburgh have been approved by a special committee of the town council, though another delay has been made by the opposition of some councillors to the pulling down of the Synod Hall. (Page 218.)

In his presidential address to the Manchester Society of Architects Mr. J. H. Woodhouse described "new art" in architecture as a mere caprice of the hour: it was not that which architects needed, but a knowledge and appreciation of old art adapted to modern conditions. (Page 229.)

Architects Boycotted by Builders.

STRANGE news reaches us from Yarmouth. This is the alleged threat of the Master Builders' Association to boycott any architect who does not give members of that Association the sole opportunity of tendering for work. The facts are as follows:—Mr. W. Lake, architect to the Great Yarmouth Board of Guardians, had prepared some alterations to the lunatic wards at the workhouse—a comparatively small undertaking—and tenders had been invited from "builders and others," but the architect refused to supply specifications to builders who were not members of the Master Builders' Association. When the point was raised at the meeting of the Guardians the architect gave as his reason the fact that other architects had been boycotted for not reserving their work to members of the Association, this boycott taking the effect of refusing to submit tenders for any work in hand. Mr. Lake said that all architects in Yarmouth were dictated to in this way. Of course this raised the ire of the Guardians, and they had the whole of the tenders burned without being opened. This is only a local affair, but if the facts are as stated it is certainly scandalous, and it is the duty of the Institute of Builders and the Master Builders' Association of Great Britain and Ireland to take up the matter and excommunicate this body. The formation of a ring is never relished by the British public, and any tendency in this direction must be put down with a firm hand. One of the reasons urged for the formation of municipal works departments has been the existence of this tendency to restrict work among the chosen few, but if architects are thus dictated to, the contractors will find an unwelcome surprise awaiting them. In the meantime the Yarmouth Board of Guardians have decided to advertise again for fresh tenders.

Bed-places.

ONE noticeable feature of French planning is the arrangement of an alcove for the bed in sleeping-rooms. This is a commendable feature, though we seldom see it adopted in this country. Alcoves are to be found in Scottish domestic work of the smaller kind, it is true, but they are never made such a feature as abroad. A similar arrangement is usual in Switzerland and Norway. In some cases the bed-place is enclosed by means of sliding doors, but in the majority of instances curtains are used. The improvement in appearance which this effects in a bedroom is very marked, and it allows the room to be used as a sitting-room. It is an arrangement which would be advantageous in small houses for country labourers, and the working classes, who require all the space possible

for bedrooms, and if an alcove were arranged in the sitting-room or kitchen it could be enclosed by a curtain when desired and would certainly be better than leaving the occupants either to erect the bed each night and take it down in the morning, or have it continually lumbering the place and being in sight. Even in large bedrooms in town or country the alcove could be utilized, for a person might be confined to the bedroom, or desirous of sitting there for reading or writing, and he could transform the room into more of a sitting-room if the bed could be enclosed. In hotels or dwellings for single men or women lodgers, who have only a combined bed-sitting-room, the arrangement is an admirable one. In planning such bed-places, however, it is well to remember two very necessary things, namely, to give sufficient space round the bed for it to be drawn out, and made easily; and secondly, to afford thorough ventilation, as it would be harmful if air were confined in a small space like this. With regard to this last, a good arrangement is to provide a lattice-work screen coming down some distance from the ceiling, the curtain for enclosing the alcove being suspended from the bottom of this.

The Eve of Architecture.

WE notice that a new rule of the Regent Street Polytechnic excludes women from attending the architectural classes held by that institution, and the occasion has been taken by interested persons to make a protest in the press against such exclusion. The subject of the lady architect is a familiar one to the profession, but we do not find that it makes any very practical headway. So far as admitting women to architectural classes is concerned, we do not see why they should not be allowed to do so; it does no harm to anyone, and it pleases the ladies! For ourselves we regard the advent of the lady architect rather as a joke, for we feel that she has neither the practical ability nor the necessary command of speech to overawe the builder and his workmen. Her sex is undoubtedly against her, and though she may find useful employment in decoration, it seems a hopeless task for her to successfully attempt architecture as a profession, despite the fact that a lady architect designed one of the cottages at the Garden City exhibition, that there happen to be two or three lady architects who are associates of the Institute, and that some varieties of slates are named after women, titled or otherwise! Perhaps it is within her ability to undertake the designing of a small house, but the idea of a lady being given the working-out and supervision of, say, a town hall or a block of city premises is ludicrous.

Correspondence.

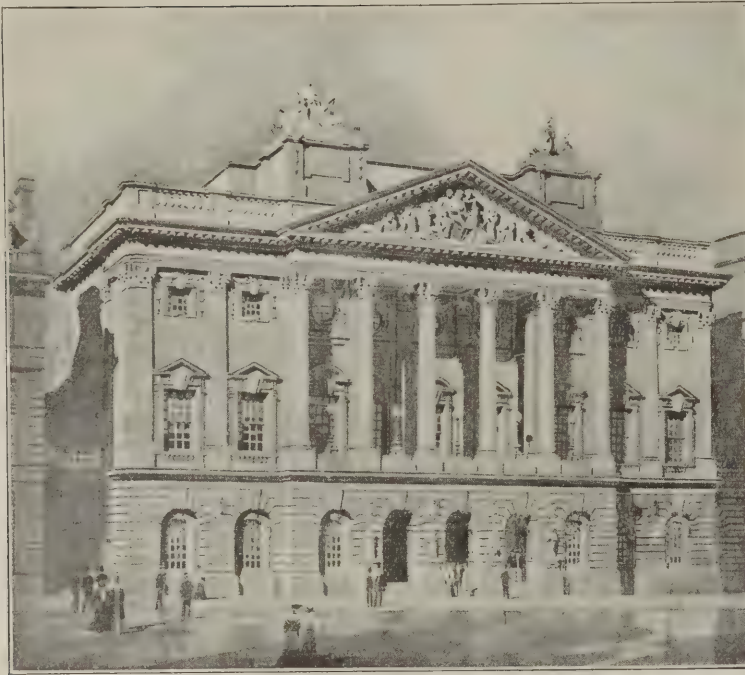
The Misapplication of the Term
"Groined."

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In your issue for October 4th the new porch at St Mary's, Lancaster, is said to be "groined." Is not this an error, and a very common one too? Surely it must be a ribbed vault, not a groined one, that is meant. Popular guide-books and people generally speak very loosely of groined vaults and groined ceilings when they mean, most likely, ribbed vaults—very different constructions; but such looseness of expression should not be permitted amongst architects. A groined ceiling, having no ribs, cannot be a ribbed one, and, therefore, conversely, if a groined ceiling cannot be a ribbed one, a ribbed ceiling or one constructed of ribs and having the interstices filled with stones resting on the ribs cannot by any possibility be a groined one. A groined vault is the intersection of at least two barrel vaults, whether pointed or not, the lines of intersection forming the groins: such vaults need centering beneath the whole of their surface during construction. In ribbed vaulting, ribs or narrow arches of stone take the place of these intersections or groins, and if the ribs be plentiful enough only those need centering, and very light ones, the interstices being filled in afterwards without any centering whatever. Hence the principle and method of construction of the one are very different from those of the other. If I may say so, the word "groined" is a negative term to indicate the absence or non-continuation of the vault at certain points, while "ribbed" is a positive term indicating the presence of a special member or feature—in fact, of the most important constructive feature of the vault. Take away the whole of the filling of a ribbed ceiling, and the ribs would still remain (e.g., the Berkelev Chapel, Bristol); take away the filling of a groined ceiling, and where would the groins be?

The groined vaults of Norwich aisles would need very different centering to the high ribbed vaults in the nave and choir.—Yours truly,
ROBERT A. DAVIS.

[Our correspondent is quite right in his contention.—Ed. B.J.]



DESIGN FOR EDINBURGH CITY HALL: ELEVATION TO CASTLE TERRACE.
R. MORHAM (CITY ARCHITECT) AND JAMES A. WILLIAMSON (DEPUTY CITY ARCHITECT).

THE EDINBURGH CITY HALL.

NEW plans for the much-talked-of Usher Hall or City Hall at Edinburgh have been prepared by Mr. Morham, the city architect, and Mr. James A. Williamson, A.R.I.B.A., deputy city architect. The idea kept in view in designing the front elevation was to bring the edifice in harmony with the general architectural tone of the city. Edinburgh is not a modern town; and in the prominent site which the hall will occupy any departure from the traditions of the ancient capital of Scotland would be accentuated.

The central or grand hall, to seat 3,500 persons, has its principal entrance to Castle Terrace, the site at present being covered by the Synod Hall, formerly the old Edinburgh Theatre. The general area of the hall is on the street-floor level, with balconies at the sides, a double gallery at one end, and platform, orchestra, chorus benches and organ loft opposite. Side entrances and corridors are provided right and left of the hall, and abundant provision is made for green-room, retiring-rooms and staircases. The kitchen and scullery are on the upper storey: and the heating, ventilating and store arrangements in the basement.

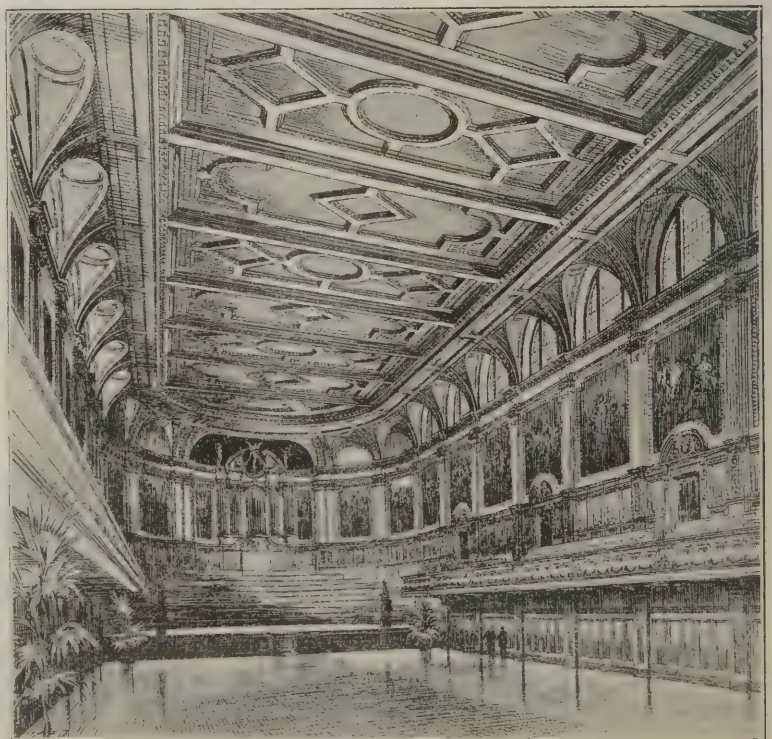
The hall is 175ft. long by 70ft. wide, and has a height of 56ft. The balconies are three rows deep, and there is a double gallery at the end opposite the platform, to which access is obtained by two staircases entering directly and independently from the outside. Behind and below the side and end galleries there will be a panelled hardwood dado, and the back of the choir is formed in a semi-circular screen of panelling. Ample light will be admitted by large semi-circular windows in lunettes above the main cornice.

Special attention has been paid to entrances and exits. Besides three wide doors from Castle Terrace, and two in each of the side entrance halls, seven of the staircases have each a separate door from the exterior. The combined widths of all the outside doors amount to 80ft., giving 1ft. per forty-four persons: and all doors open outwards. The inner entrance hall is 70ft. long by 25ft. wide, off which there is direct access to the main hall and the two principal staircases. Under the grand hall is the lower hall, 92ft. by 70ft., with independent access from the outside and means of communication with the grand hall.

In considering the cost it has to be kept

in mind that the former plans were on a most expensive scale. The total sum left by the late Mr. Usher was £100,000, to which has to be added interest for a number of years. The committee of the town council have decided to restrict the total outlay (including purchase price of site) to the amount of the bequest, and they have adopted these new plans. Exclusive of organ, sculpture and site, but including furnishing and fittings, the estimated cost is £78,270.

When the scheme was brought before the full meeting of the Edinburgh town council recently, delay was moved and carried, certain members desiring fuller information about an adjoining site before deciding to pull down the Synod Hall. The plans approved by the special committee were freely criticized by several of the councillors, but the matter now seems within distance of final settlement.



EDINBURGH CITY HALL.

LAYING-OUT ESTATES.

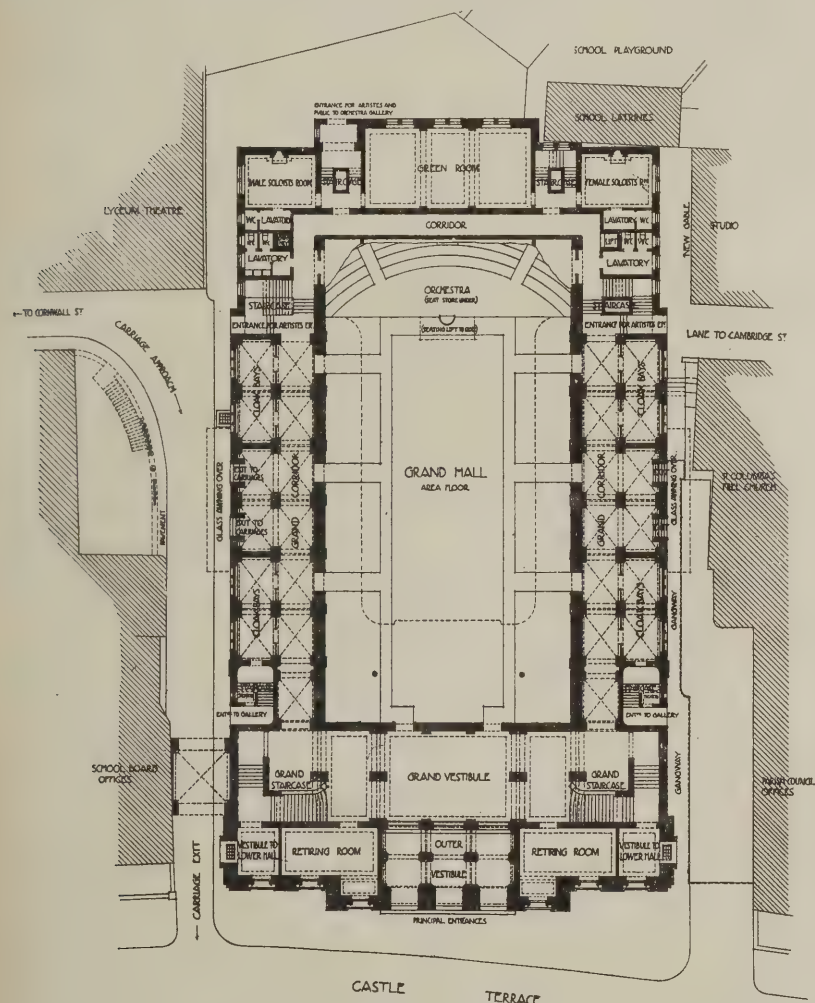
At a sessional meeting of the Institute of Sanitary Engineers held on October 4th a paper was read by Mr. A. A. Kemp, F.I.S.E., by way of opening a discussion on Estate Development. After observing that the construction of roads, the provision of a drainage scheme, water supply and lighting all came within the province of the sanitary engineer in connection with the development of estates on the fringes of towns, Mr Kemp proceeded to describe the work. First the estate had to be surveyed, which might be done with a chain in the ordinary way, but in many cases it was much better, and, in fact absolutely necessary, to use a theodolite, a magnetic compass, or a box sextant: the compass and the sextant were suitable for small surveys only, and should not be used for work of any magnitude. For accuracy

readings on the horizontal and vertical limbs. Keep the vertical arc clamped, and catch the sun on its descent by its intersection of the opposite side of the web of the instrument. Take the reading of the horizontal limb, and bisect the two readings; this will give true south. Now reverse the instrument and set up a ranging rod; clamp the instrument at zero and turn to the right, recording the angle at the first station, and proceed to read each angle round the traverse. These stations being fixed, the boundaries and set-offs can be obtained in the ordinary way. We are now in the position to make the plan.

"The next thing to be done is to lay out some schemes of roads. In deciding these it is well to have them arranged so as to get as many of the houses as possible facing the south. There should be one or two roads at least not less than 50ft. wide; for the inter-

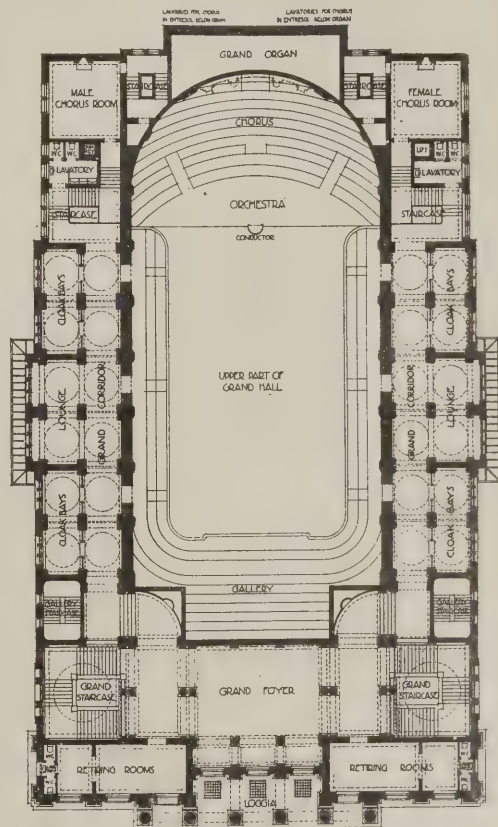
building land it has always been my practice to provide accommodation roads running between the plots at the rear. In these roads the sewers should be laid, as most of the houses are drained to the rear of the premises. Free access for the collection of house refuse is also given, and the constant repairs to the main street through sewer connections is greatly minimized; and another great advantage is the prevention of carrying the house drains under the buildings.

"Having decided roadmaking, our next question is to provide a sewage-outfall works and main drainage scheme. The first stage is to take levels over the routes laid out for the sewer. In new works, where there is only a field before one and no points that can be definitely used as bench marks (such as there are in towns), it would be well to put in stumps about every two chains apart, for the purpose of levelling, although I have seen



Principal Floor Plan (Castle Terrace Level).

EDINBURGH CITY HALL.



First-floor Plan (Balcony Level).

nothing was so reliable and satisfactory as the theodolite, when using which the traverse system of surveying was generally adopted.

"Before actually proceeding with a survey it is always as well to wall round the land once or twice, and make notes of the various positions, and to fix your stations. If you can obtain an Ordnance map of the district a rough sketch diagram should be made, marking these points and numbering the angles. If an Ordnance map is not obtainable, a rough sketch diagram must be made in the field-book, showing the positions of the stations.

"When traversing it is usual to commence at the extreme western station. The true north is generally ascertained by getting the meridian from the sun.

"The instrument is set up about 1½ hours before noon, at the same time noting the

secting roads a width of 36ft. is sufficient. All these should be well drained and constructed with even gradients.

"As to the best material for roads and the thickness required for making a good bottom, this varies so much under local circumstances that it is quite impossible to describe what is necessary. It would be well to point out that the worst soil to contend with in road-making is clay. In every case the site of the proposed road should be lined with faggots or brushwood before any hard material is placed upon it. This should be covered with 12ins. at least of hard core, well rolled down to receive a 6in. covering of good pit flint, the whole to be well consolidated with a heavy steam roller. It is important that all gas and water mains should be laid before the roads are made.

"In laying-out an estate for the purposes of

these driven down and removed in some cases; thus when you are looking for the bench marks sometimes after taking the levels for laying the sewers you have no guide for fixing the sight rails. To obviate this, I have found that a good plan is to have the stumps about 2ft. long, driven until the tops are level with the surface of the ground; then to excavate round the stump about 1ft. diameter and 6ins. deep, and fill in with cement-concrete, level with the top of the peg. This is rather an expensive plan, but without this the cost of labour in picking up levels from distant points more than compensates for the extra expenditure."

Mr. Kemp then proceeded, in conclusion, to consider the sewage-disposal works or outlet, observing that it was important to arrange this if possible at the lowest point, so as to avoid any cost of raising the sewage.

CHEAP COTTAGES.

Close of the Exhibition at Letchworth.

THE exhibition of cheap cottages at Letchworth (Garden City) formally ended on Saturday last, though, of course, as the cottages are to remain—many of them having already been acquired—it will be possible for anyone to still see the outskirts of them, at least. The cheap half-crown return fare from King's Cross is no longer obtainable, but one can get a return ticket for 3s. 6d. any day.

Earl Carrington's Letter to the "Times."

A good deal of final criticism about the cottages has been going on during the past week, the most important contribution to the subject being Earl Carrington's letter to the "Times" of Thursday. Referring to Mr. J. St. Loe Strachey's statement that the present cost of a cottage in the country was at the very least £250, the noble earl says: "In my experience the alleged impossibility of obtaining a good substantial labourer's cottage with three bedrooms, living-room, kitchen and scullery for £150 does not exist, and I am sure that many landowners and a large number of practical land agents and builders who have been erecting hundreds of labourers' cottages throughout the country at a cost not exceeding £150 per cottage will agree with me in this. If landowners, when building cottages, gave definite instructions to their agents that the cottages were not to cost more than £300 per pair, they would find that it could be done for this amount; if, however, landowners simply instruct their agents to build a pair of cottages and give them *carte blanche*, the agents, naturally taking a pride in the estate and their work, turn out a pair of model cottages for £400 or £500 with unnecessary extravagance and costly ornamentation which in no way adds to the comfort of the labourers.

"To obtain cheap cottages there is no necessity to have recourse to 'wattle and dab,' or 'claybats' (consisting of clay and chopped straw dried in the sun). Such expedients may have been a necessity in the mediæval ages, but they are out of place in modern civilization.

"I have built on my estate forty-three new cottages at an average cost of £156 13s. per cottage. These cottages were built by contract in different places in Buckinghamshire and Lincolnshire, and included not only brick and slated cottages but also cottages in brick and tile; and, moreover, included the extra cost of piling for foundations to several pairs of cottages which were built in the Lincolnshire Fens, where the natural subsoil gives an unsatisfactory foundation.

"I have now adopted a standard design for cottages on the Carrington estate; the cottages are built in gin brickwork with slated roofs, and contain living-room and kitchen, each 12ft. by 11ft., washhouse, pantry and offices, and each cottage has three bedrooms. The average cost of these cottages has been £153 10s., which of course includes contractor's profit, and the wages paid have been the standard wage in the district. I have never had any difficulty with regard to by-laws, as these cottages will pass the by-laws of any rural district council. Nothing, of course, has been allowed for architect's fees, as the plans were designed by my agents, and with the specification have only cost the actual amount paid for lithographing copies. . . . Should any landowner or land agent wish to see the plans and specifications of the cottages I have built, I have instructed my agents, Messrs. J. Carter Jonas & Sons, Market Place, Cambridge (by whom they were designed), to forward them free on application."

Councillors' Criticism.

As representative of the Lambeth Borough Council Mr. Bristow visited Letchworth and

reported that not a house on the estate could be applied to London or its suburbs, that the boasted £150 was a myth, and the prize cottages were (in his opinion) defective. The company gave £40 per acre for the land, and they did not sell the freehold, but let on building leases at an average of £17 10s. per acre, which at twenty-five years' purchase came to about £400 per acre and left a good margin for the initial expenses of laying out the estate. With regard to the conferences on housing held at Letchworth, Councillor Bristow says: "I must call attention to the request for payment of 5s. for each delegate; for, allowing 500 delegates and 1s. per man for expenses, the company would clear about £100 per conference."

At last week's meeting of the Yarmouth Town Council a report was submitted by Councillors A. Stanley and W. J. Rushmer on the Letchworth cottages. The councillors carefully examined several houses of each class, and came to the conclusion that the detached cottages were not suitable for reproduction in Yarmouth, as they could not be economically built, and occupied a large amount of ground, but the semi-detached houses and the groups of four houses formed very desirable types of healthy, pleasant and well-planned dwelling-houses worthy of consideration in planning future areas and lending themselves to the improved architectural treatment of streets, but necessarily involving a larger amount of ground to each dwelling-house than at present.

Proposed Blackpool Exhibition.

A scheme of cheap cottage building carried out on an experimental scale at Cleveleys, near Blackpool, has provided so large a demand for cottages at the seaside that a project has been promoted for the holding of a competition next summer on lines similar to those adopted at Letchworth. The Fleetwood Estate Company has set aside a site for the exhibition, and a committee is engaged in the preparation of the details. The prizes offered are announced to be more advantageous than those of Letchworth.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Sanatoria.

J. C. M. writes: "Have you ever published any plans for small consumption sanatoria of about twenty to thirty beds suitable for a country town?"

No; we have published plans of the King's Sanatorium, and you ought to be able to draw up a satisfactory plan from these and from the several books and essays that have been published on the subject.

M.A., B.A., Society of Arts.

TOTNES.—H. J. writes: "What examinations have to be passed in order to obtain the degrees of Master of Arts and Bachelor of Arts; also what is the condition of membership of the Royal Society of Arts? To whom can I apply for application forms?"

Master of Arts and Bachelor of Arts examinations are held by all the Universities. The Royal Society of Arts is open to anyone on payment of the subscription; the address of the secretary is John Street, Adelphi, London, W.C.

Creosoting a Wooden Building.

WALTON-ON-THAMES.—E. H. writes: "Should creosote be applied hot or cold on a wood building, and is there such a thing as green creosote; if so, where can I obtain it?"

Creosote is usually applied cold but is not so efficacious as tar thus applied; timber should be boiled in the creosote. As regards a green creosote you probably refer to the green "Solignum"—a well-known wood-preserved, also in three shades of brown—made by Messrs. Major & Co., Ltd., of Hull.

Patent Bricks.

GLASGOW.—G. writes: "The Scottish Brick and Stone Co., Ltd., is now being floated to work a patented process of the Hydraulic Brick and Stone Co., of Liverpool. Can you give me any information about the quality and durability of the material? Has it been used in any important buildings, and are they in appearance and quality equal to terra-cotta or other facing bricks? Do you think such a company would be a success?"

We presume the bricks in question are made by a kind of sand-lime process. Bricks of this kind have been used for many years in Germany, France and America, and have been found satisfactory. The usual defect is their shortness and want of resistance to fire, crumbling under heat and water. With the object of overcoming these defects the Asbestos Brick and Tile Co., Ltd., of Lodge Place, St. John's Wood, London, N.W., who recently erected works for their manufacture, incorporate asbestos fibre, we believe. The process of setting the hydraulic lime is in all cases performed by steam under pressure in huge cylinders. The great merits of this class of bricks are the sharp arrises and exactness of form and pleasing colour at a slightly less cost than ordinary clay facing bricks.

Examination in Honours, Building Construction.

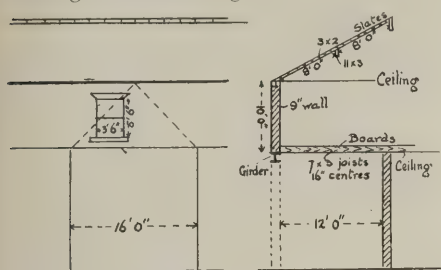
STOCKTON-ON-TEES.—F. T. S. writes: "I wish to pass the Honours, Building Construction examination, and intend to sit for Stage III. next May. I have passed Stages I. and II. I have both of C. F. Mitchell's building construction books, but would like another book on Stage III. or Stage III. and Honours (final) combined. Please recommend one. Also, where can I obtain particulars of the examination in architecture which all intending candidates for the Honours, Building Construction are required to pass, and where can I obtain questions set for same at the last examination?"

You will find Rivington's "Notes on Building Construction" (4 vols.) valuable to you not only for Stages III. and Honours but in after-life, and the money they cost is a good investment. The price of these volumes is given in our book list. The syllabus of the South Kensington examinations in building construction is to be purchased separately, price 1d., or bound up together with the syllabuses of the other S.K. examinations in the Board of Education's "Syllabuses and Lists of Apparatus applicable to Schools and Classes other than Elementary," price 4d., both published each year by Messrs. Eyre & Spottiswoode, East Harding Street, London, E.C. The examination papers are not published separately, but are to be obtained together with papers on other subjects in the "Science Examination Papers" for 1877 to 1888, 1890 to 1895, 1897 to 1899, and 1901 to 1904, price 6d. each, also from Messrs. Eyre & Spottiswoode.

Weight on Girder.

MANCHESTER.—F. J. A. writes: "Please give a simple practical method of determining the weight required to be carried by a girder in a case similar to that shown by the sketch sent. Am I right in assuming that as the brickwork is self-supporting

to a certain extent the weight of it can be determined by making a triangle with span as base and the top of the wall as apex, and allowing, say, 1 cwt. for each cub. ft. of brickwork? In this case how is weight of roof determined? I presume, of course, if joists run the opposite way there would be no weight for floor on girder."

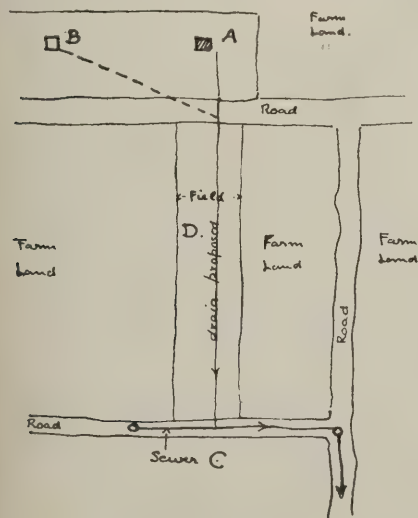


All the loads being directly over the opening, they should be figured as resting on the girder, because the wall supports the weight of roof and ceiling in addition to its own weight, and also because the height of the wall is less than the opening. For lintels over small openings it is customary to assume that the lintels will carry only that part of the wall which is enclosed by an equilateral triangle whose sides are equal to the width of the opening in the wall. The weight of the wall can with sufficient accuracy be assumed to be uniformly distributed and figured thus:—

$$w = \frac{9' \times 120 \text{ lbs.} (16' \times 10' - 5'5' \times 3'5')}{12'} \\ = 12,667 \text{ lbs., or about } 5\frac{3}{4} \text{ tons.}$$

Connection to Sewers.

BUXTON.—G. A. E. S. writes: "A on sketch plan is a house at pre-ent in course of erection. It was arranged to construct a small septic tank in the grounds for the disposal of the sewage. My client now proposes to carry the drain straight through field D (about 100 yds. long), of which he is the owner, and connect to the nearest sewer at C. He also suggests that the drainage from a future house B could be connected to the drain, as shown by dotted line. Apart from possible objections by the local authorities, do you consider this advisable, or likely to lead to trouble in the future?"



It is certainly better to connect to the public sewer, from a health point of view. Small disposal plants should never be laid down unless absolutely necessary, as the treatment of sewage requires a knowledge, skill and attention that the layman is rarely able to give. At the same time there may be difficulties in the way of connecting to the sewer in this case. The proposed connection has to cross a public road to reach your client's other land. It is unlikely, too,

that the authority would permit the connection from B, as this would constitute the drain a sewer, repairable at the public charge, and this would confer on the authority a right of easement over your client's land to attend to and repair it. Even if the authority acquired the drain subsequently for the purposes of a sewer, its passage through your client's property might be found troublesome in the development or utilization of the land. If the authority were approached, it is possible, however, that some arrangement might be come to so that the sewer was extended up the road to a point near your client's house, he paying a sum not exceeding the cost of the private drain he proposes to lay.

Designing Reinforced Concrete Lintels.

GLASGOW.—J. M. J. writes: "I shall be glad to know what would be the cheapest and most suitable section for checked concrete or granolithic lintels for spans of 7ft. gins. and 6ft. 8ins.; distance to wall-head 8ft.; and for spans of 6ft. 8ins. and 4ft. with the roof only to support. The thickness of wall is 9½ins. (two 4½ins. with ½in. vertical asphalt). It will be rough-cast on the outside and plaster rendered on the inside. I intended reinforcing the lintels with steel bars or something equally simple, as the work will be carried out by a builder who has no experience of reinforced concrete. Diagram sent (not reproduced.)"

In the case of the two reinforced lintels with spans of 7ft. gins. and 6ft. 8ins. respectively, and blank wall above for a height of 8ft. carrying one wall-plate of roof 15ft. span: taking the 7ft. gin. lintel first, we have for load, say, wall 1ft. thick (including rough-cast, ½in. vertical asphalt, plaster and two 4½in. thicknesses of brickwork) at 1 cwt. per cub. ft.; and assuming the whole weight of superincumbent brickwork to come on the lintel = 7'75ft. × 8ft. × 1ft. thick × 1 cwt. = 62 cwt., plus 7'75ft. × 10ft. length of one rafter × ½ cwt. per sq. ft. for roof = 62 + 38'75 = say, 5 tons distributed along beam, as in Fig. 1. Assuming a beam gins. deep (three courses of brickwork) and 9½ins. wide (thickness of wall), as in section Fig. 2, and allowing an area of metal of $\frac{1}{60}$ th area of beam = $\frac{9'5 \times 9}{60}$

say $1\frac{1}{2}$ sq. ins., then for approximate tensile stress in steel or compression in concrete we have $\frac{WL}{8d}$, where w = load in tons, L = span

in feet, d = effective depth in feet. The effective depth is found by setting down a parabola with breadth of beam as base and depth to centre of reinforcement as height, and taking the centre of gravity of the parabola at $\frac{3}{8}$ of the height. Then the effective depth equals distance from centre of gravity of parabola to centre of reinforcement.

$$\frac{WL}{8d} = \frac{5 \times 7'75}{8 \times 4} = \text{say } 12'1 \text{ tons ten-}$$

sion. Allowing $7\frac{1}{2}$ tons per sq. in. for steel in tension, $7'5 \times 1'5 = 11'25$ tons safe stress, disregarding strength of concrete in tension. Testing the concrete for compression, the effective area will be as shown by the shaded parabola = $\frac{3}{8} \times 8 \times 9'5 = \text{say } 50$ sq. ins. at 500 lbs. per sq. in. = 11'16 tons safe compressive stress; so that the section shown in Fig. 2 will be about sufficient. For the 6ft. 8in. beam under similar conditions the same section may be adopted. Checking the above method by the formula used by the Trussed Concrete Steel Co. of America, again disregarding the tensile strength of concrete, $R = \frac{3}{8}(d - y) + y; aF$, where R = ultimate moment of resistance of beam, d = depth in inches to centre of reinforcement, y = distance from centre of reinforcement to neutral axis in inches = $\frac{15a + bd^2}{30 + 2bd}$

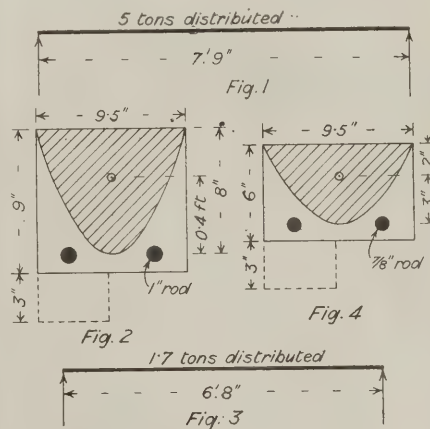
a = area of metal in square inches, b = breadth of beam in inches, F = ultimate tensile strength of steel = say 30 tons per sq. in.,

$$y = \frac{15 \times 1'5 + 9'5 \times 8^2}{30 + 2 \times 9'5 \times 8} = 2'75. R = \frac{3}{8}(8 -$$

$2'75) + 2'75 \times 1'5 \times 30 = \text{say } 27'135$ ton-ins., and allowing a factor of safety of 4 = 6'784 tons-ins. safe moment of resistance. The bending moment M = moment of resistance R .

$$M = \frac{WL}{8} = \frac{5 \times 7'75}{8} = 4'84 \text{ ton-ft.} = 58 \text{ ton-ins.,}$$

so that the beam will have a little excess of strength. For the other pair of lintels, with spans respectively of 6ft. 8ins. and 4ft., placed close up under, and with nothing else but the roof to support, proceed in a similar manner. Taking the 6ft. 8ins. case, as in Fig. 3, for the load we have $6\frac{3}{4} \times 10 \times \frac{1}{2}$ cwt. = 33½ cwt., say 1'7 tons distributed; then $\frac{WL}{8d} = \frac{1'7 \times 6'6}{8 \times 2'5} = \text{say } 5'7$ tons tension in steel and compression in concrete, shown by the shaded parabola in Fig. 4. Area of steel = $\frac{9'5 \times 6}{60} = '95$, say 1 sq. in. at $7\frac{1}{2}$ tons per sq. in. = 7'5 tons against 5'7 tons actual stress. Area of shaded parabola $\frac{3}{8} \times 9'5 \times 5 = \text{say } 32$ sq. ins. at 500 lbs. per sq. in. = 7'14 tons safe compressive stress on concrete. The 4ft. lintel may also be made of the same section, as all the beams should be of a suitable depth to bond with the courses of brickwork, i.e., a multiple of 3ins. Checking the



REINFORCED CONCRETE LINTELS.

last calculations by the Trussed Concrete Co.'s formula, y will be found to be 1'5ins., then $R = \frac{3}{8}(d - y) + y; aF = \frac{3}{8}(5 - 1'5) + 1'5 \times 1 \times 30 = 11'1$ ton-ins., and allowing the same factor of safety of 4 we have $\frac{11'1}{4} = 2'775$ ton-ins. Then, as before,

$$M = R, M = \frac{WL}{8} = \frac{1'7 \times 6'6}{8} = 1'417 \text{ ton-ft.} \times$$

12 = say 17 ton-ins., so that the lintel will be easily strong enough. As the loads allowed for are the maximum, assuming that the brickwork is imperfectly bonded, the rods might be reduced in size to, say, $\frac{3}{8}$ in. diameter in the first case, Fig. 2, and to, say, $\frac{1}{2}$ in. diameter in Fig. 4. The portions shown dotted in Figs. 2 and 4 may be moulded on to the lintels to form recess for window heads.

HENRY ADAMS.

Drainage from Stable and Washing Yard.

BIRMINGHAM.—F. W. H. writes: "The drainage from a three-stall stable and water from washing yard have to be dealt with by means of a septic tank; also a small amount of rain and surface water. What size should the septic tank be, and how far away from the building?"

A septic tank in the opinion of most authorities should be constructed to contain twenty-four hours' flow. The farther away

the better, but much depends on the situation, whether near the house or not; say 100 yds. Stable sewage is strong in ammonia, so that it is well to keep it dilute—or the septic action may be impaired.

Stress Diagram for Roof Truss.

FAREHAM.—STUDENT writes: "Please give a stress diagram for the wrought-iron roof truss shown by the accompanying drawing. I want a diagram showing particularly how the total reactions due to wind-pressure and weight of roof, on both supports, and the directions of same, are determined. The weight on the roof is 40 lbs. per sq. ft., the wind-pressure from left side normal to roof 30 lbs. per sq. ft., and the span 40ft."

The frame diagram of proposed truss is shown in Fig. 1. The corresponding stress diagram (Fig. 2) is constructed in the usual manner. Point 9, Fig. 2, found by the funicular polygon, divides the total reaction into the portions acting on each side according to the direction of the wind, and the inclined reactions may either be taken as given or resolved into the horizontal and vertical direction, as shown in connection with Fig. 1.

HENRY ADAMS.

Diverting Underground Springs.

GLOUCESTERSHIRE.—M. writes: "A built his house in 1901, and obtained a good supply of spring water, which was found under the public path and conveyed to an underground tank. B has allowed C to supply his house with water by means of an underground tank, and has diverted the water from flowing into A's tank; consequently A is now without water. What remedy has A against B for interfering with his supply? Can B legally cut off A's supply? B's intention is to make A pay for his supply. Sketch sent (not reproduced)."

The dates respectively when "A" built his house and when "B" diverted the water have no bearing upon the case. The law recognizes "no property in subterranean water," and therefore, if this is "underground water," "A" has no legal remedy in reference to the interference with his supply. On the other hand, if the "spring" consists of water naturally flowing in a well-

defined channel, "A," being the owner below "B," can demand that the flow be continued to him without any material diminishment. There appears to be nothing to prevent "A" from sinking a well on his own property at a point close to the footpath, and in such a position as to tap the supply before it reaches "C's" tank! F. S. I.

Design for Lattice Girder.

GLASGOW.—C. E. M. writes: "Kindly give all dimensions for a lattice girder to carry a distributed load on the bottom flange

of 30 tons on a 45ft. span. I have worked it out by graphic methods, but would like to have it checked by your expert."

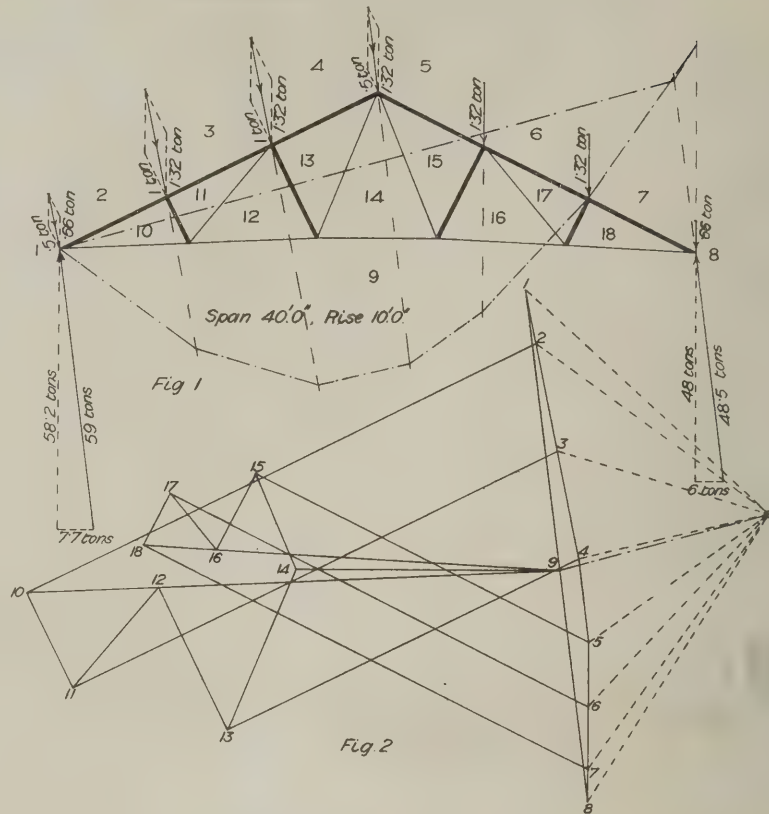
Assuming the frame diagram of the lattice girder to be as Fig. 1, the stress diagram will be as Fig. 2 and the nature of the stresses and the approximate scantlings as in Fig. 3. The joints will have to be very carefully designed in order to ensure uniformity of strength with the other parts. The subject should be properly studied from such a work as "The Practical Designing of Structural Ironwork" (Spon, 8s. 6d.), in which, among other things, a small lattice girder bridge is fully worked out.

HENRY ADAMS.

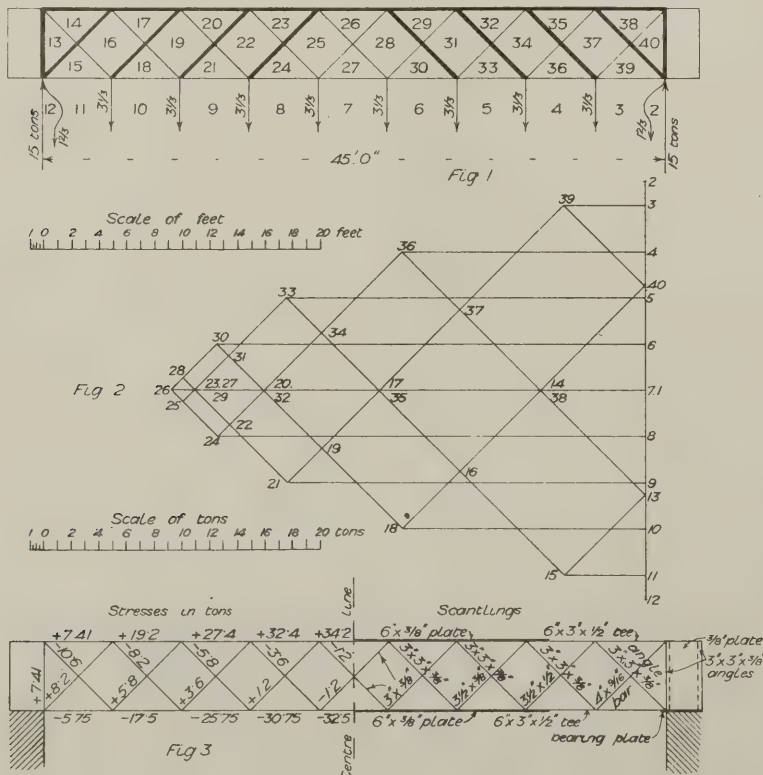
Damp Walls and Wall Paintings.

WORKING.—A. A. M. writes: "In a house more than 200 years old to which I am making various additions and alterations the staircase walls are painted with mythological subjects, the work being attributed to Sir Godfrey Kneller or his pupils. In certain atmospheric conditions the walls run with moisture. There is no sign of damp affecting any other parts of the hall or anything in the hall; there are plenty of openings, and there is no lack of ventilation. What do you think is the cause of the trouble and what can I do to cure it? The paintings have apparently at some time been varnished, and the plaster being now rather uneven, parts are dull and other parts bright. The dull parts seem to be covered with some substance resembling mildew but it will not come off, although it has often been washed. This may of course be due to dust having settled on some of the parts when sticky, but while under my supervision it has always had a perfectly hard surface. If you can account for the wet running down the walls I shall be glad."

The walls affected are probably external, and being colder than the contained air condense moisture; varnish is notably cold. The remedy would be to keep the staircase air cold; or to insulate the walls by erecting a 4½ in. skin to form a cavity wall, or plastering on battens.



STRESS DIAGRAM FOR ROOF TRUSS.



DESIGN FOR LATTICE GIRDER.

THE TIMBER TRADE.

London Market in September.

A SATISFACTORY feature of the London timber trade during September was the increased overside deliveries, amounting to about 4,000 standards of sawn and prepared wood. The deliveries from the docks were practically the same, but compare with very small figures for 1904. The nett result of three-fourths of the year's trading is that there is a reduction in the whole consumption of about 1,400 standards compared with last year, 19,000 standards compared with 1903 and 32,000 with 1902; and Messrs. Churchill & Sim infer that the demand has at length touched its lowest point, the state of the general business of the country seeming to support this view. Considerable quantities of Russian and Swedish stock were placed during the month, and coast buyers have been encouraged to come into the market by more inland activity. London practically confined itself to the importation of prepared boards, which have been sold freely from Sweden. Prices have been quite steady at the lower levels established in the summer, especially for deals. Freighters are more difficult to arrange, and the tendency is towards rather higher rates for late autumn loading.

Messrs. Denny, Mott & Dickson, Ltd., state that the general tone of business during September was good; the volume of trade improved, and a confident feeling as to the future continues to gain ground. The subsidence of the world-wide political disquiet has tended to brighten trade prospects generally; but the still more practical fact of the drastic cutting down of over-commitments which has marked the trading of recent years is now creating a wholesome demand in most directions with a view to supplementing unduly bare stocks.

The abstract of dock stock, consumption, &c., for September, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on September 30th was—

	Pieces.
Foreign deals and ends - - -	1,755,000
Do. battens - - -	2,748,000
Pine deals and battens - - -	1,003,000
Spruce do. do. - - -	798,000
Boards, rough - - -	4,085,000
Do. prepared - - -	7,501,000

Totalling 17,890,000 pieces, as compared with 19,365,000 for 1904, 20,546,000 for 1903, and 23,475,000 for 1902.

In other kinds the stock was as follows:—

Foreign wainscot logs - - -	173 pieces.
Do. oak timber - - -	680 loads.
Do. fir timber - - -	1,189 do.
Do. Oregon pine, &c., spars and masts - - -	4,056 do.
Colonial oak timber - - -	1,456 do.
Do. birch timber and planks - - -	6,451 do.
Do. elm and ash timber - - -	775 do.
Do. yellow pine - - -	694 do.
Do. red pine - - -	94 do.
United States pitch-pine timber - - -	13,524 do.
Do. do. deals - - -	54,000 pieces.
East India teak - - -	7,331 loads.

The deliveries for the first nine months have been of—

	Pieces.
Foreign deals and ends - - -	2,347,000
Do. battens - - -	4,350,000
Pine deals and battens - - -	782,000
Spruce do. do. - - -	1,056,000
Boards, rough - - -	3,975,000
Do. prepared - - -	11,302,000

Totalling 23,812,000 pieces, as compared with 25,761,000 for 1904, 27,636,000 for 1903, and 29,078,000 for 1902.

The deliveries for September have been of—

	Pieces.
Foreign deals and ends - - -	276,000
Do. battens - - -	470,000
Pine deals and battens - - -	76,000
Spruce do. do. - - -	82,000
Boards, rough - - -	378,000
Do. prepared - - -	1,181,000

Totalling 2,465,000 pieces, as compared with 2,545,000 for 1904, 2,825,000 for 1903, and 3,284,000 for 1902.

Deliveries from Ship to Craft.

The deliveries direct from ship to craft for the first nine months of the year have been:—

	P.s.h.	1904.	1903.	1902.
Deals and battens	92,392	84,963	88,850	87,907
Boards - - -	19,725	15,056	19,087	18,648

Total - 112,117 100,019 107,937 105,555 and for September—

	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens	13,377	10,528	13,486	14,516
Boards - - -	2,940	1,491	2,196	1,783
Total	16,317	12,019	15,682	16,299

Soft Woods.

Swedish Deals and Battens.—Messrs. Churchill & Sim report that the shipments from Sweden to London of battens and prepared boards especially were rather heavier in September. A large business was done in the latter at prices which showed some improvement, perhaps just enough to cover the extra freight and insurance. Battens continue to be short in stock, and are quite firm at the fullest August prices, but deals are not wanted at present, and there is no inclination to add to the stock, short though it is.

Norwegian Boards.—From Norway a moderate importation kept prices steady with a tendency here and there to improve. The demand has been a little better, and shippers are looking for higher prices for late autumn and winter shipments.

Russian Deals.—The September arrivals from the White Sea were on a very small scale, and the large business transacted in Russian deals during the month was confined entirely to the outports; London merchants have not taken any great interest in shippers' autumn stocks, although they have been offered at tempting prices. The coast importers, on the other hand, came forward freely and absorbed most of what was offered to supply the inland demand, which shows some sign of expanding at last. The state of the London demand for deal sizes is best indicated by the fact that the stock is the smallest held for many years, and yet Messrs. Churchill & Sim say deals are perhaps the worst market they have.

Finnish Battens.—A fair demand met the September importation, which was an average one, and prices were fully equal to the August level. The current sizes in Finland being to a great extent those most wanted here, merchants have been turning their attention mainly to this source of supply. Deals have been offered freely, and some low prices have been accepted for large lines to the outports. Scantlings, especially in redwood, have done well, and whitewood is firm in sympathy with a shortage of stock in most producing countries.

Prussian Timber.—One or two small parcels of fir timber arrived from Prussia to fulfil contracts, but there was no free market. Oak has been selling more freely, and the stock is now very small.

Canadian Timber.—A moderate importation of pine deals from Canada has sent the dock stock up a little, but the demand has almost entirely fallen upon the lower qualities. The very high prices of the better grades of deals have militated against any active consumption, and the trade is still slow and unremunerative. There is a much better feeling in the spruce market in common with competing whitewood from other sources of production. The stock is small, and the only barrier to a larger business is the firm attitude of the shippers, who are trying to educate buyers to a better appreciation of the probable value of spruce in the near future. There is no doubt that stocks are low, both on this side and on the other. Two small shipments of sawn pitch-pine timber arrived during the month to refresh the reduced stock. The demand was better, and, with the very high prices asked for fresh supplies, a good market seems to be assured for the present. The large shipments to the River Plate and elsewhere have left shippers independent of the European demand to some extent, unless at prices which are higher than those ruling in markets where sawn timber is principally used. Deals have been selling rather more freely, but the low prices of North Europe supplies tend to check any decided move upward.

Hardwoods.

Teak.—Messrs. Denny, Mott & Dickson, Ltd., state that the landings in the docks in London during September consisted of 675 loads of logs and 304 loads of planks and scantlings, or a total of 979 loads, as against 526 loads for the corresponding month of last year. The deliveries into consumption were 891 loads of logs and 305 loads of planks and scantlings—together 1,196 loads, as against 478 loads for September, 1904.

This improved demand for consumption serves to show that consumers, who have naturally been holding back from purchasing teak at an unprecedented high cost, are recognizing that the increase in price has been legitimately caused by the shortage of supplies in India; and as this shortage promises to last at least all next year, the position of belated buyers will grow worse rather than better. As the realization of this fact develops, a large demand will probably mark the closing quarter of the year, and landed stocks will probably be unhealthy exhausted by the opening of the new year.

Mahogany.—This market has developed a better tone. In the face of light imports, auction prices have been satisfactory. A larger volume of supply of first-class descriptions of mahogany would be welcomed. Messrs. C. Leary & Co. observe that the outlook continues to be encouraging; the demand is maintained and the arrivals have been by no means excessive. Only one auction was held during the month, and the results were satisfactory.

Odessa Oak.—This market is inactive, owing to the exhaustion of the present season's stocks; but the enquiries for next season's outget promise a good business in

ABSTRACT OF STOCK, CONSUMPTION, &c., FOR SEPTEMBER.

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock - - -	1,483,249	2,964,672	1,000,946	798,349	53,232	6,300,448	4,085,068	7,501,137	19,750
Monthly public dock consumption - - -	225,684	499,556	74,951	82,446	7,442	881,079	375,279	1,162,561	2,863
Overside stock - - -	924,332	2,030,902	310,297	341,326	—	3,616,857	1,553,055	941,674	—
Overside consumption (estimated of dock):—									
82 per cent. Sawn } 55 " Planed }	185,061	402,256	61,460	67,606	—	716,383	307,729	637,409	—
Duration of supply at same rate of consumption - - -	5' 49 months.	5' 40 months.	9' 11 months.	7' 60 months.	7' 15 months.	6' 21 months.	8' 26 months.	4' 69 months.	6' 90 months.

this wood for next year, as it has found increasing favour with consumers as a reliable and valuable oak when shipped with proper care and judgment.

LIVERPOOL TIMBER TRADE.

(By Our Special Correspondent.)

MORE activity was noticeable in the Liverpool timber market during September. This has been largely due to the more settled condition of trade in the towns of Lancashire and Cheshire since the holiday season came to an end. Building operations in these towns are now in full progress, and a very fair demand for light and heavy building timber has been experienced from them. In the Liverpool district, also, there has been a better demand for joists, scantlings and flooring boards for residential housework. Some big jobs in the district are making demands for rough timber, and will shortly require sawn and manufactured material. Work at the new cathedral has reached the stage at which a large amount of strong timber for staging and scaffolding is wanted. The new central tramways' offices in Hatton Garden have reached the same stage; and an extensive office-building job in Old Hall Street is nearing a similar condition. In the Kensington, Fairfield and Knotty Ash districts residential house building is now proceeding more briskly, and more timber is being taken for this class of work. Along the line of docks the new works are proceeding rapidly and much heavy timber is being used.

At the last meeting of the Dock Board recommendations by the Works Committee that certain sidings be laid down on the east side of Brunswick Dock at an estimated cost of £1,600, and that a single storey shed be constructed on the west side of Brocklebank Dock, with the necessary roadway, at a total estimated cost of £29,200, were adopted. The demand for timber on dock works' account is therefore likely to be maintained for some time to come.

Deals and Pines.

Spruce deals have come to hand in quantities which would have well sufficed to meet requirements. But one has only to survey the Derby Road stocks to see that the supplies of this timber are more than abundant and that there is no likelihood of any shortage for some time to come. More interest, however, has been shown in spruce, and the tone of the market has improved. The eagerness to buy was very noticeable at the spruce auction sales held on September 20th and 21st. At the first of these, Messrs. A. F. & O. Mackay's sale, nearly the whole of the deals, scantlings and boards offered found purchasers at fair prices. As an indication of values it may be mentioned that deals of 9ft. and upwards, and 3ins. by 8ins., brought £7 12s. 6d., and 3ins. by 11ins. £9; while fourth-quality deals brought £6 15s., spruce boards £6 10s., scantlings £6 12s. 6d. for 3ins. by 5ins. and £6 17s. 6d. for 3ins. by 6ins.

On September 21st, at Messrs. Alfred Dobell & Co.'s sales, the hardening of freights and the probable advance in prices consequent thereon were cited as reasons for liberal buying: 3in. by 6in. spruce deals were sold at £6 12s. 6d., and 3in. by 12in. £7 10s. Scantlings, 2½in. by 6ins., £6 15s., and 3in. by 5in. £6 10s.

A fair demand for flooring boards has been experienced, as local requirements for these boards have been greater on account of building work. Supplies have, however, come to hand which have about replaced the quantities withdrawn. Prices continue to harden, the talk of higher freights also affecting this timber.

Arrivals of pitch-pine have been light, but stocks of all kinds are much in excess of any likely demand. Sawn wood has met

with fair enquiry; and a considerable shortage in the receipts for the year, as compared with last year—and still more with 1903—is shown by the returns.

There is evidently a large and steady consumption of sawn pine inland, but without fresh supplies the stocks would serve for fully three months on the basis of recent requirements.

Mahogany.

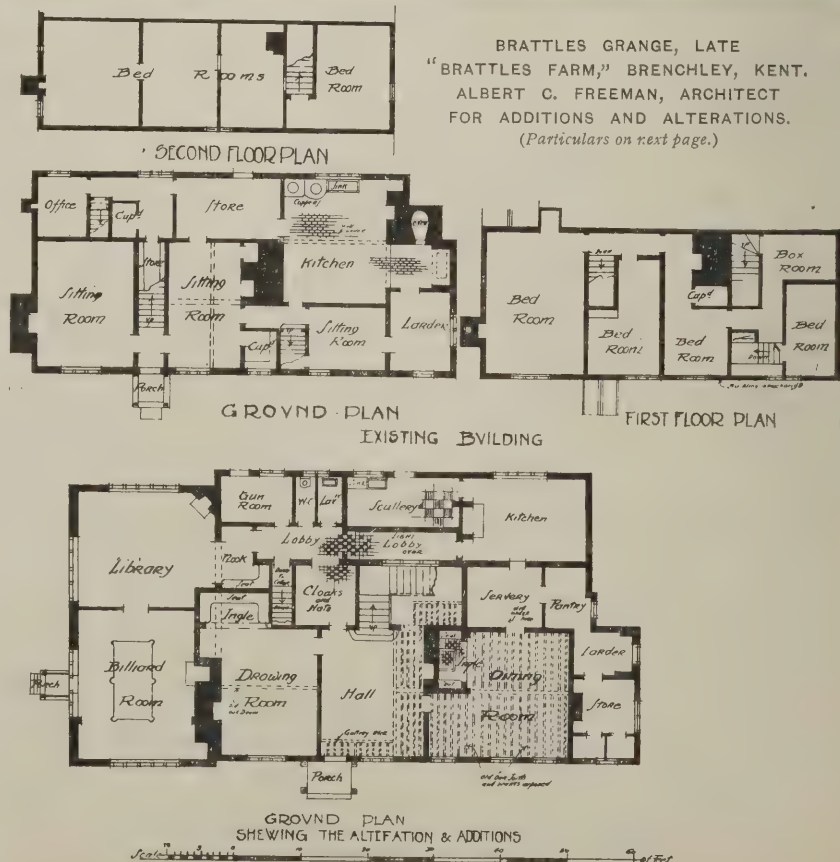
The demand for mahogany, in view of cabinet-makers' Christmas season requirements, has been more active, and more interest has been shown generally in this wood. Arrivals have been but moderate in quantity. Three auction sales were held in the course of the month, and stocks of high-class wood found ready buyers. With respect to business actually done, a consignment of Laguna wood offered by Messrs. Farnworth & Jardine proved of much interest, and bids for most of the lots were made freely. Some lots were passed at the first offering, but on

being offered a second time later, to clear, were sold at 3d. per foot. The price obtained for the whole consignment worked out at 31½d. per foot. Square cedar offered at this sale realized 4½d. and 5d. per foot.

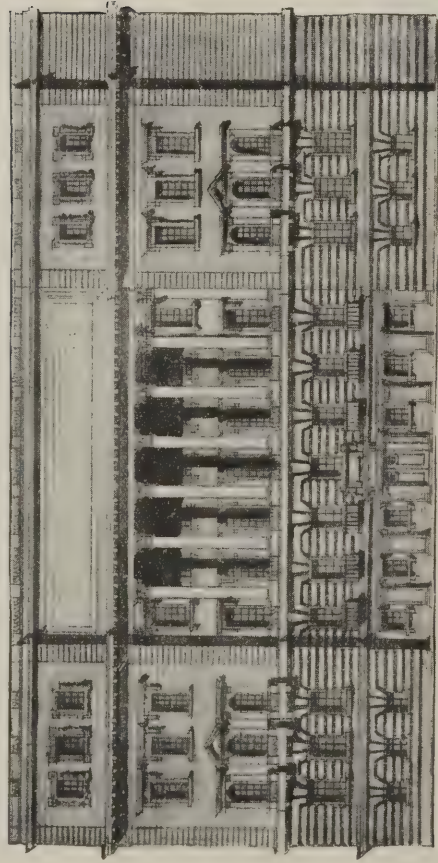
On the following day Messrs. Alfred Dobell & Co. offered a considerable aggregate stock of mahogany of different kinds. Generally wood of quality excited interest and sold at a good price. Mexican, Colombian and Honduras wood has been practically out of stock.

Oak.

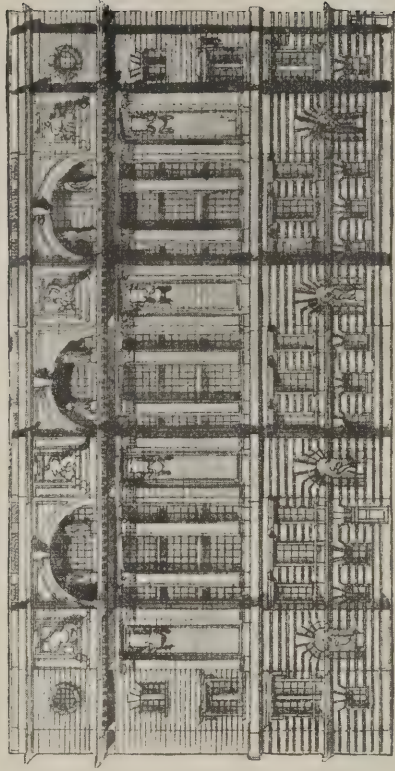
This wood, in miscellaneous lots, came to hand freely through the month. Of the consignments, planks received by Mr. A. Kershaw, strips and bundles by Messrs. James Kennedy & Co., Ltd., and strips and inch boards by Messrs. Lyle & Pollock, have been among the more important. Oak lumber has been received to a considerable quantity in the aggregate. Planks keep in very short supply, the receipts for the year up to date being



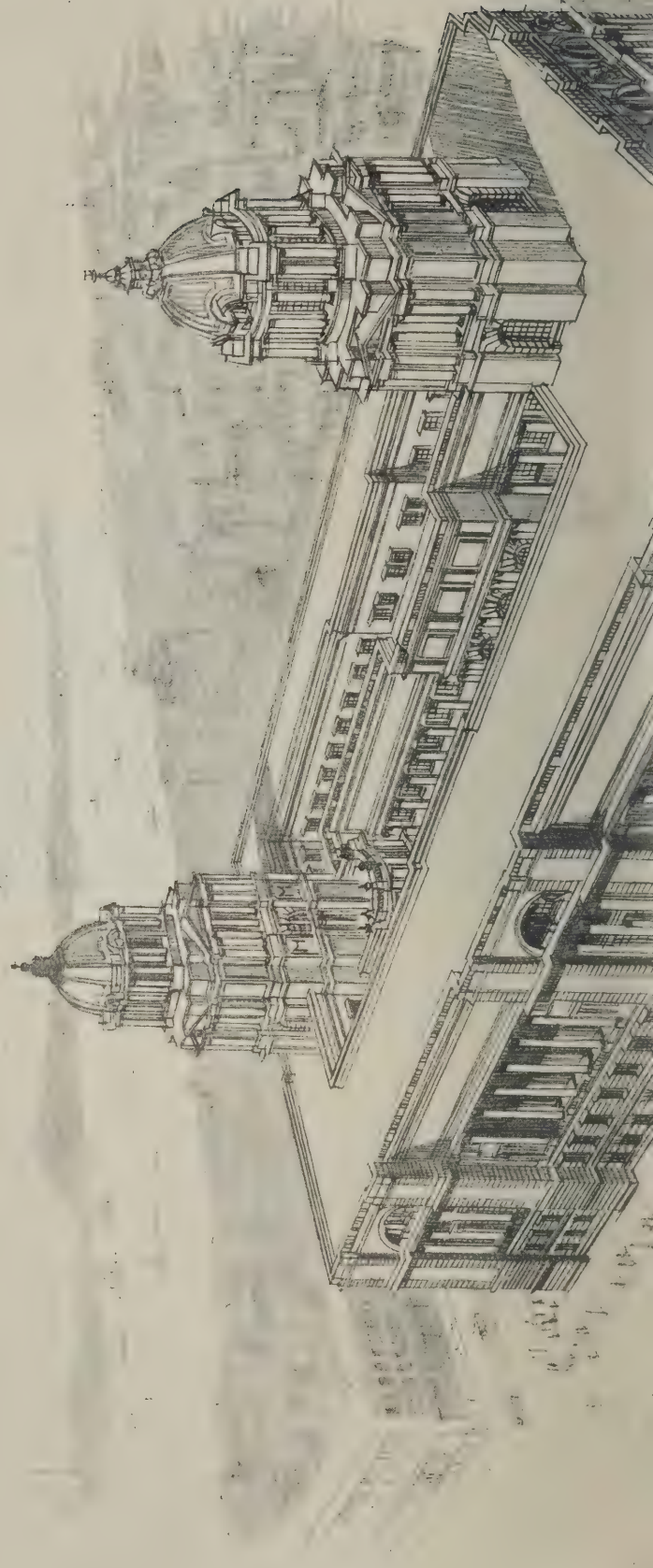
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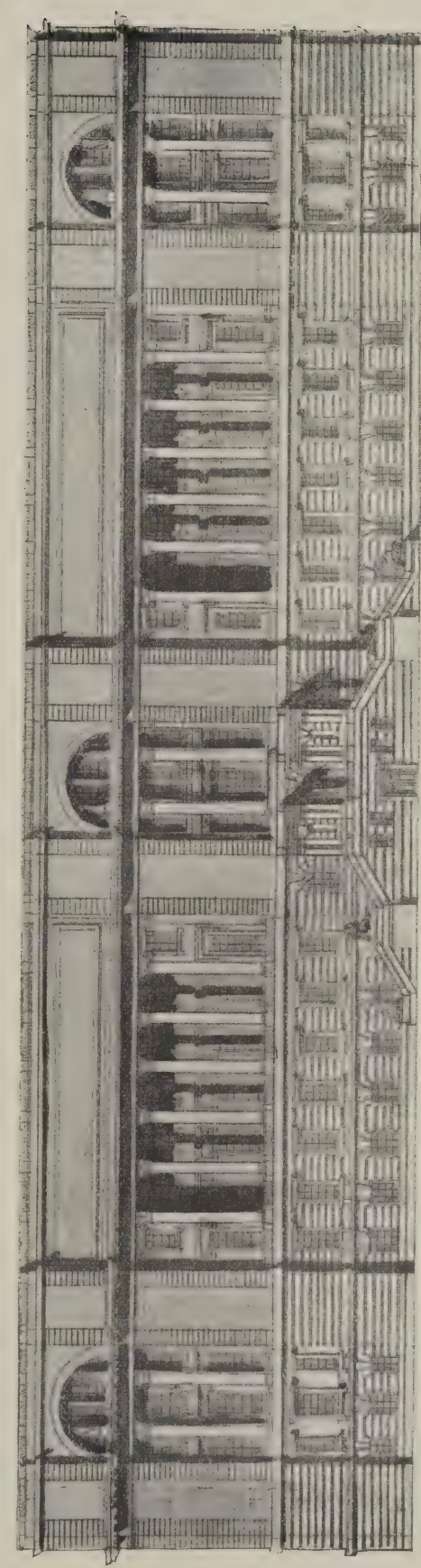
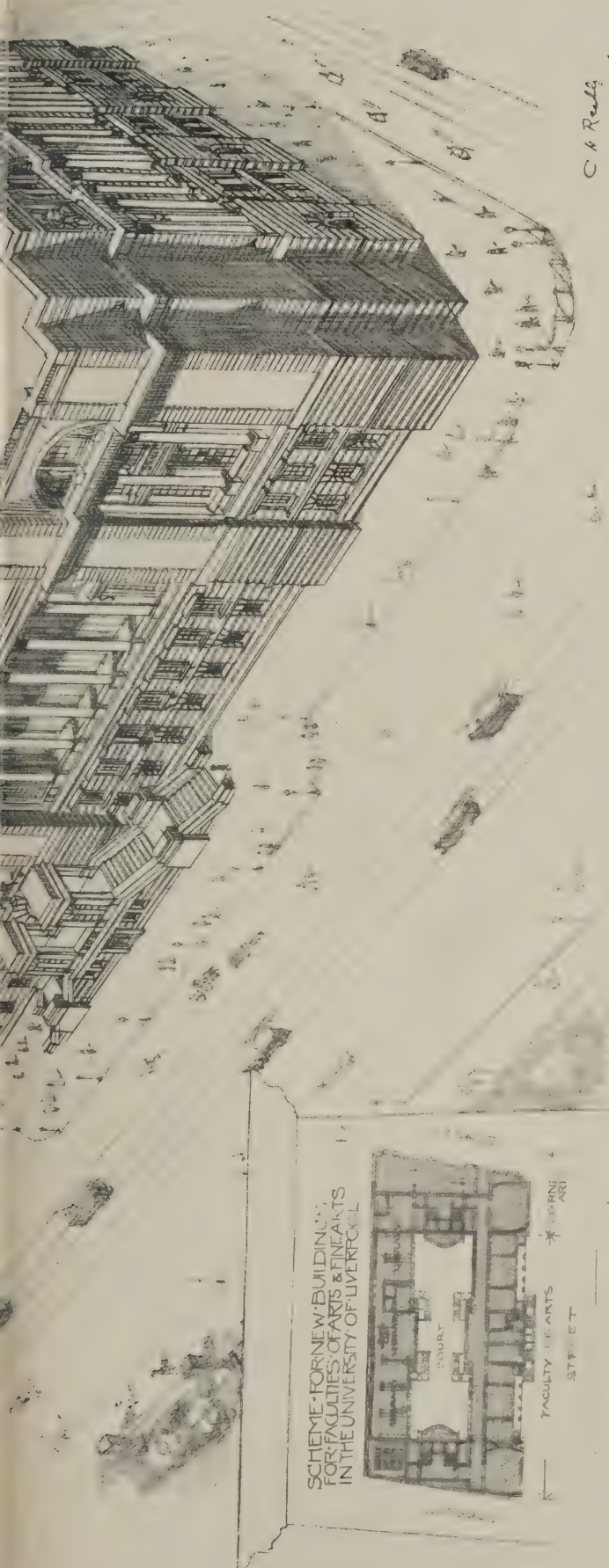


RETURN (SOUTH) FACADE OF BLOCK DEVOTED TO THE LIBERAL ARTS.



RETURN (NORTH) FACADE OF BLOCK DEVOTED TO THE FINE ARTS.





SCHEME OF NEW BUILDINGS FOR THE FACULTIES OF ARTS AND FINE ARTS FOR THE UNIVERSITY OF LIVERPOOL. PROFESSOR CHARLES H. REILLY, M.A., A.R.I.B.A., ARCHITECT,
 (Royal Academy Exhibition, 1905.)
 MAIN FACADE (EAST).

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greatly below the receipts of each of the last two years.

Teak.

Further receipts of this wood have increased stocks. These are now large, the consumption of late being comparatively light.

Walnut.

This wood, in logs and lumber, has been received in fair quantities. The demand, in view of winter requirements, has been rather better, but as stocks are abundant, prices continue low.

Manufactured Goods.

A number of consignments of manufactured goods came to hand through the month. Among these were a consignment of 1,700 doors, received by Mr. John J. Swan; a consignment of dowels by Lytle & Pollock; woodware by Alfred Dobell & Co., Ltd.; and sundry consignments of handles, &c., by different firms.

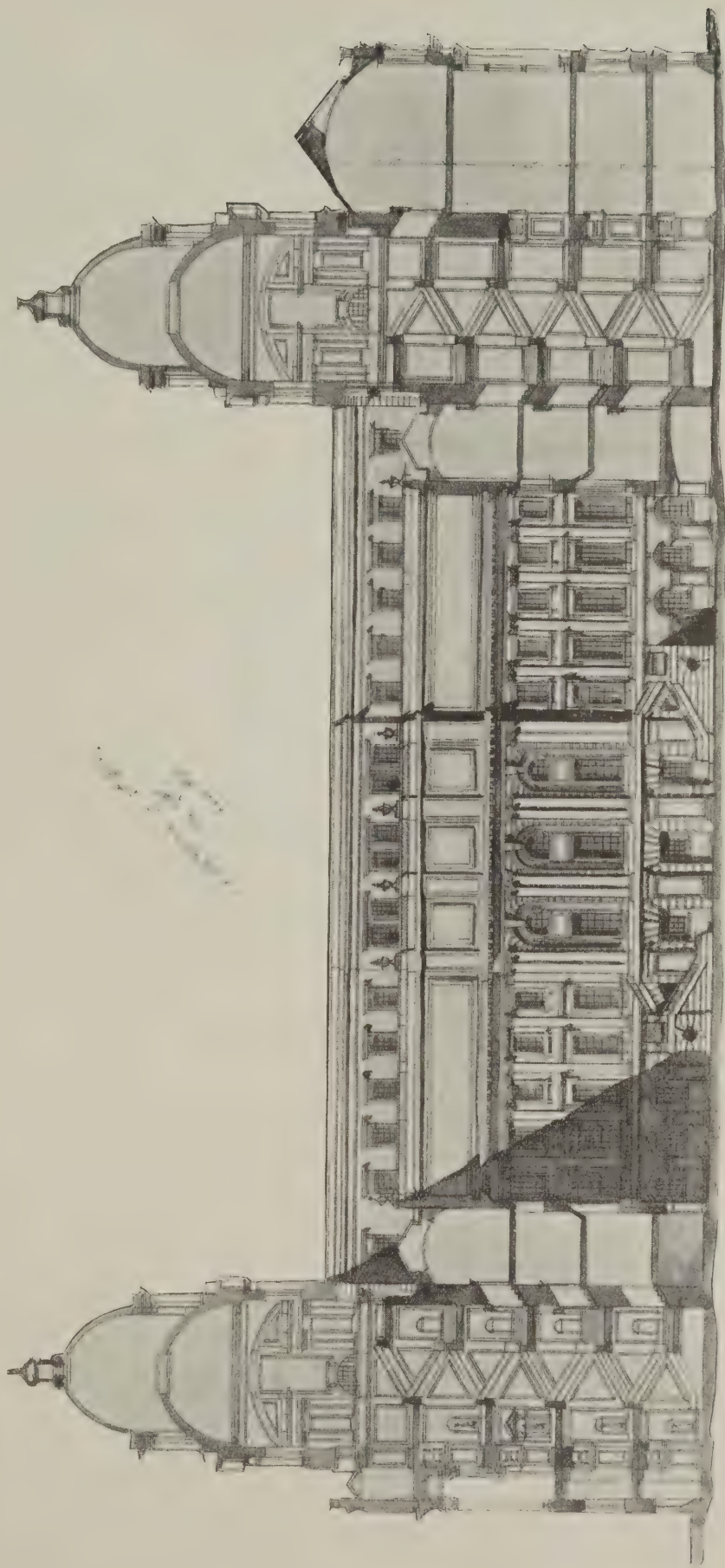
At the mills, sawing has been active, the freer movement of builders' timber, locally and inland, having made more work. The cartage of timber to the Derby road stations for transport inland has also been more active, testifying to the improved demand for timber for building purposes.

OUR PLATE.

THIS architectural scheme by Mr. C. H. Reilly (who is the Professor of Architecture at the University of Liverpool) was prepared for a certain island site in Liverpool as a building to be devoted to the Faculties of Arts and Fine Arts. The quieter portion of the site in the rear is occupied by the Library Block, the various divisions of which form seminar rooms for teaching and study, contiguity in plan representing kindred subjects, *e.g.*, the rooms for the different languages being roughly in the same relation to each other as those languages. The northern end of the building, on account of light, is designed for schools of architecture, painting and sculpture. The main feature of the design is (in the opinion of the architect) the long internal courtyard ending in the symmetrical domes, here illustrated. The top floor is for museums and the basement largely for the School of Education, with practising rooms. The Senate Room and the Main Theatre are on the first floor. The recessed loggia is to cloak the number of storeys of windows necessitated by the confined site. The drawings were hung in this year's Royal Academy Exhibition.

BRATTLES GRANGE.

THE plans on the opposite page show the alterations and additions carried out to convert what was known as "Brattles Farm" into a residence for Mr. T. Hay-Edwards. The building, which is one of the many sixteenth-century farms to be found in Kent, has been reconstructed with as little alteration as possible to the existing front, the annexe being designed to match the other work in every detail; the outside timbering is of old oak obtained from the demolished farm buildings. The new walls are faced with old red bricks, and the roofs are covered with old tiles, some of which bear the following inscription, burnt in: "Samuel Harman, May.12.1748." The plaster to the ceilings of the hall and dining-room of the house has been stripped, and the beams and joists (of oak) have been cleaned and left exposed. The old fireplace in the centre of the building was with some considerable difficulty reconstructed to form an open fireplace in the hall, and an inglenook was arranged in the dining-room. The work, which was carried out last year from the designs of Mr. Albert C. Freeman, architect, of London, was executed by local builders upon a scale of charges, it having been found impossible to fix a contract owing to the great amount of unseen work. Mr. J. H. Walker acted as clerk of works.



SCHEME OF NEW BUILDINGS FOR THE FACULTIES OF ARTS AND FINE ARTS FOR THE UNIVERSITY OF LIVERPOOL: ELEVATION OF INTERNAL COURTYARD AND SECTION OF NORTH AND SOUTH ENDS. PROF. CHARLES H. REILLY, M.A., A.R.I.B.A., ARCHITECT.



Photo: S. B. Bolas & Co., 68, Oxford Street, W.

THE NEW POST-OFFICE BUILDING TO BE ERECTED IN NEWGATE STREET, LONDON.

SIR HENRY TANNER, ARCHITECT.

Views and Reviews.

Engineering Mechanics.

This book on mechanics, written essentially for engineers, is truly a remarkable achievement by Professor Goodman. It is distinctly the clearest and most serviceable of all the books on the subject that we have yet seen. It is of course not so elaborate as some works, but it contains an immense amount of information all conveyed in the shortest and most intelligible way. It fully deserves its success in having reached a fourth edition and a numerous and wide circulation abroad. The fact that it is used largely in the United States shows its sterling qualities. Students are assumed to have a fair knowledge of elementary mathematics and theoretical mechanics, and the book is intended to assist them to apply their knowledge to practical engineering problems. The calculus has been introduced sparingly. There are many illustrations in the book which serve to increase its clearness. A good feature is the table of annotated and explained data on mensuration of figures, centres of gravity, moments, inertia, &c. The author is distinguished by his acquaintanceship with practical difficulties, which he has endeavoured to meet; most authors of books on applied mechanics have been theorists who, while delighting in abstruse mathematical explanations of small matters, have neglected to deal with the many difficulties experienced in practice. Thus this is one of the few books which deal with eccentric loading of struts and with wind-pressure on awkward-shaped roof trusses. We would still like to see the calculation of members in curved roof-trusses dealt with. The book treats of many branches of engineering, such as mechanisms, the steam engine, beams, struts, structures, hydraulics, hydraulic motors and machines, and pumps, but we think architectural students would be all the better for a thorough study of this book.

"Mechanics applied to Engineering," by John Goodman, Wh. Sch., M.I.C.E., M.I.M.E., Professor of Engineering in the University of Leeds. London: Longmans, Green & Co., 39, Paternoster Row, E.C., price 9s. nett.

THE NEW POST-OFFICE BUILDING.

ON Monday the King laid the foundation-stone of the new post-office building which is to be erected on two-thirds of the site of Christ's Hospital (the Bluecoat School, now removed to Horsham, in Sussex). We illustrate the design above. This has been prepared in the Office of Works under the direction of Sir Henry Tanner. The building will contain the main sorting office for those letters now dealt with in the old Post Office at St. Martin's-le-Grand, and it seems doubtful what will be done with Smirke's building.

R.I.B.A. NEWCASTLE VISIT.

ON Thursday last in the Assembly Rooms, Newcastle, the mayor and mayoress (Alderman and Mrs. J. Baxter Ellis) accorded a formal reception to members of the Royal Institute of British Architects.

On Friday the annual dinner of the Institute was held (Mr. John Belcher, A.R.A., presiding). In giving the toast of the evening the Duke of Northumberland, speaking for the allied societies, offered the Institute a hearty welcome to the North-country, while speaking for the Institute he should say that the local associations were a matter of great interest to it; and it was by the strengthening of those local associations that the real work of the Institute was carried out. Turning to the position of architecture to-day, he said he did not think any young architect could hope to do very much better, say, in ecclesiastical architecture than the people of 500 years ago, and as for the fine old manor houses—well, they might give them fewer steps to go up and down than there were in these manor-houses, and he did not doubt that their sanitary arrangements might be better, but he very much doubted whether they would give us anything which was more picturesque or more thoroughly English. The young architect, when he reflected in that way, might be a little bit discouraged, but if he would go further he would find that there was a great field for his ingenuity

and his study, even in this matter-of-fact twentieth century—more especially in the matter of public buildings and the erection of houses for the working classes: and finally the opening which was offered by the zeal of the Board of Education. He suggested that members of the Institute and those whom they trained might very well devote a great part of their attention to assisting local bodies in the effort to meet the requirements of the Board of Education at some reasonable rate, without the necessity of covering the landscape with horrible structures such as they sometimes saw.

Programme for the Next Session.

The following is the programme of the Royal Institute of British Architects for the forthcoming session:—

- Nov. 6.—President's opening address.
- Nov. 20.—Mr. R. A. Denell, of the Waring-White Building Co., Ltd., on "American Methods of Erecting Buildings."
- Dec. 4.—Business meeting.
- Dec. 18.—Mr. Alexander Gascoyne and Mr. A. J. Dix on "Stained Glass."
- Jan. 8, 1906.—Business meeting.
- Jan. 22.—Mr. John M. Swan, R.A., Mr. Montague Fordham and Mr. Walter Gilbert on "Metalwork." Award of prizes and studentships.
- Feb. 5.—President's address to students. Presentation of prizes.
- Feb. 19.—Mr. E. Guy Dawber on "Furniture."
- Mar. 5.—Business meeting. Election of Royal Gold Medallist.
- Mar. 19.—Paper (subject to be announced).
- April 2.—Mr. W. Aumonier and Mr. A. W. Martyn on "Woodcarving."
- April 23.—Mr. G. P. Bankart and Mr. Lawrence A. Turner on "Plasterwork."
- May 7.—Annual general meeting.
- May 21.—Mr. Paul Waterhouse on "The London Traffic Commission Report."
- June 11.—Business: annual elections.
- June 25.—Presentation of Royal Gold Medal.
- July 16 to 21.—Seventh International Congress of Architects, London.



TIN ROOFING.

IN America tin roofing has been extensively employed in past years, though latterly a number of other materials, new and old, have come into favour; but there are still multitudinous examples to show that tin roofing has withstood the weather for more than half a century and remains good to-day. There are instances where terne plates have been known to last on a roof 100 years, but they were of iron, not steel; there is a church in Vermont whose steeple was covered with iron plates coated with pure tin in 1816, and it had never been painted up to 1903—87 years on a roof. A paper on this subject was read recently before the National Association of Master Sheet-metal Workers at Milwaukee, in the course of which the author, Mr. William Martin, made some useful remarks about the fixing of tin roofs. He said:—

“The modern way of nailing a flat-seam roof is one of the worst enemies of a tin roof, for every nail you put through the plate itself invites a leak, and it is a matter of surprise that the largest manufactory of terne plate in the world should advocate this very system in its book, ‘A Fifty-Year Roof.’ By this system you nail the sheet direct to the

Roof board, using $\frac{3}{4}$ in. or 1 in. wire nails, five or seven to a sheet, three or four on the long seams, two or three on the short seams. Then the seam is hammered down over the nails, covering them up—or is supposed to do so; but as the seam is barely over $\frac{3}{4}$ in., even if carefully put

in, the edge of the nail is only $\frac{1}{16}$ in. from the edge of the seam. In soldering-off the solder runs round the nail head, not over it, for it cannot; and in five or seven places in the seam you have a covering of only $\frac{1}{16}$ in. In nine cases out of ten you will find the leaks near these nail heads. This is a cheap way, but one of the worst which can possibly be adopted.

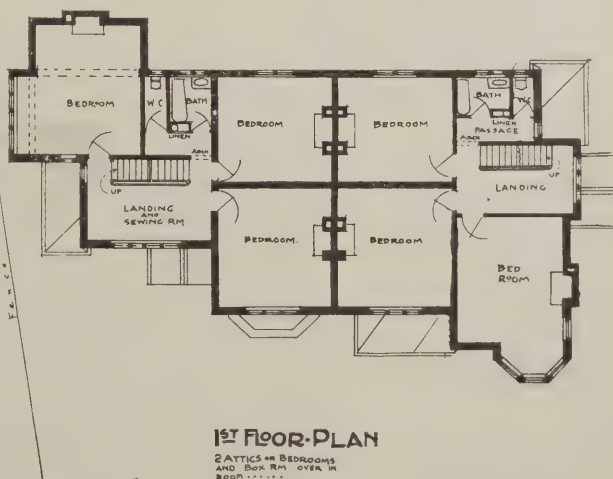
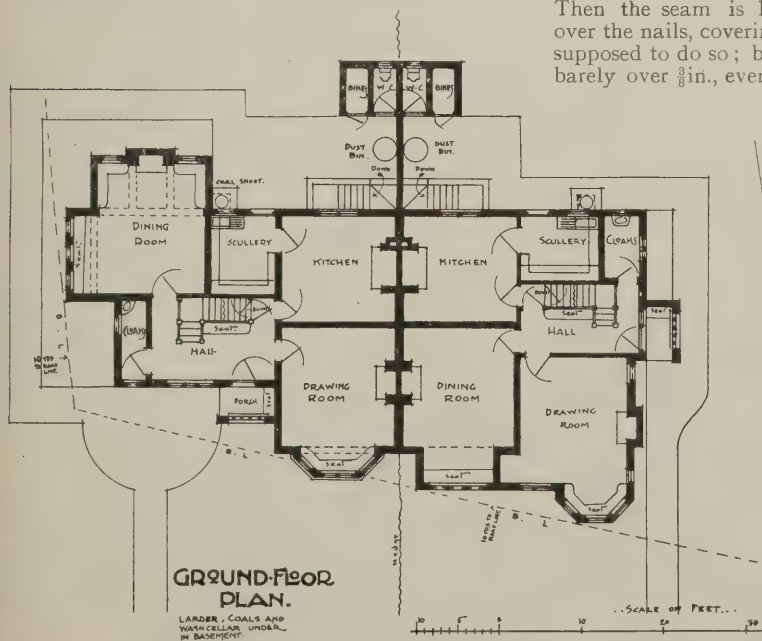
How a Tin Roof should be put on.

“There is only one way to put on a tin roof—that is, cleating for both flat and standing seams. If put on in sheets, three $\frac{1}{4}$ in. or 2 in. cleats to the cross seams and five on the long seams on every 14×20 sheet; if put on in rolls, a cleat every 4 ins. or 5 ins. By this method, when the seams are flattened down and the roof soldered off and the seams well soaked, you have practically a solid sheet of tin for a roof. Every seam is as good a sheet, if not better, and not a nail-hole on its entire surface, as the nails are put through the cleat, not through the plate. All expansion and contraction is taken care of, with no buckling of the sheet.

“The above are undoubtedly the main



causes of the decadence of terne plates as a roof covering, and until a satisfactory permanent remedy is found and the good old-time methods of putting on the plates are adopted, the material will continue to be passed by and neglected as a roof covering.”



HOUSES IN LEICESTER ROAD, HALE, ALTRINCHAM.

JOHN COCKER, ARCHITECT.

These houses are built of local bricks with grey mortar joints, the base being of pressed stock bricks. Runcorn stone is introduced in places, the gables are plastered, and the roof is of grey slates. The architect is Mr. John Cocker, of Altrincham.

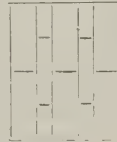
STRENGTH OF BRICKWORK.

THE week before last we announced that the Royal Institute of British Architects had re-issued in volume form* the report on brickwork tests conducted by a sub-committee of the Science Standing Committee in 1895-7, and in now reviewing the book we have collected into table form, for comparison, the results of all the various recorded tests of any value.

The strength of brick piers is of importance, and the information that has been obtained from the tests by the Royal Institute of British Architects and by the United States Government at the Watertown Arsenal are distinctly valuable, but it must be confessed that all these tests do not satisfactorily settle the question. Much further investigation is necessary before any adequate theory can be arrived at. The tests, both in this country and in America, have not been carried out in a thoroughly scientific manner. The piers have been built in a haphazard way by ordinary workmen, the bonding has been imperfect, the mortar evidently has not been always exactly according to formula, and the time and subjection to weather have not been the same; hence there can only be the roughest comparison. It is true the test piers have been built in the haphazard way that might be expected in ordinary practice, but it is impossible to discover any theoretical law by such means; although such tests will be valuable enough when the theory of the stresses in brick piers has been worked out, as affording a basis for the factor of safety to be allowed in practice and for by-laws. It is the duty of the Royal Institute, as the representative body of architects in this country, to bring the present chaotic state of knowledge of construction into some order and to elicit scientific data about important details where no data exist. In this respect the Institute has been sadly lacking. The Institutions of Civil and Mechanical Engineers and other professional bodies have carried out many

experimental tests, and the Institute cuts a sorry figure beside them. The strength of walls and piers is of primary importance to architects, and further series of tests are wanted. As the matter also largely affects engineers, we think the R.I.B.A. should have the co-operation of the Institution of Civil Engineers.

The tests in 1895-6 were in three series—the first and second to show the strength of 18in. piers at three months and six months respectively, and the third including short lengths of wall. A powerful hydraulic press, together with a specially designed frame, were contributed by Sir William Arrol for the experiments. This press allowed piers 6ft. high to be tested. The short walls were practically only piers measuring 27ins. by 18ins. It will be seen that the height was less than for a pier generally required in practice, and the American tests on piers up to 10ft. show that the difference of 4ft. is considerable; 10ft. appears to be as little as should be tested, being about the minimum height for a pier in practice. The size of the piers, namely 18ins., was reasonable, as smaller piers are seldom required and would be inadvisable, though the American tests were mostly on piers 8ins. and 12ins. square. The bonding was the ordinary one, each course having on two faces stretchers and on the other faces three headers and two closers, joints in alternate courses crossing. The plan



of each course was thus: This was a faulty bond, in permitting a small vertical joint 2½ins. by 2½ins. throughout the height of the pier in each of the angles, which proved generally to be the point of failure.

The piers were built by a large firm of contractors at day-work prices; and the bricklayers, finding the Leicester red and the Staffordshire blue bricks very hard to cut, filled in a great portion of some piers with closers of London stocks, which destroyed the value of the piers for experimental purposes. Fresh piers were built and tested, and these piers, having been built under the careful supervision of a clerk of

works, were of such superior workmanship that the results were higher with lime-mortar than those of the earlier tests with cement; they have therefore been omitted from our table as exceptional and not likely to be obtained in ordinary practice. This fact and the illogical character of some of the results show the influence of workmanship and clearly prove the uselessness of these tests for the scientific determination of theoretical laws.

The sand used for the mortar was Thames sand sifted and washed, and better quality than usual in practice. The lime was grey stone lime unground, slaked and made up by hand. The cement was Portland. The mortars were subjected to chemical analysis, but this proves nothing as to their strength, because in some cases results seem to show that cement-mortar was worked up after setting, and this suggests the differences that might be caused by temperature and the amount of water used in mixing which were not recorded.

The bricks were of five kinds, as shown, and in testing the hardest ones for crushing the machine was not powerful enough to take whole ones, so that half ones were used, and they proved to be about 25 per cent. weaker than whole bricks. This we have added in computing the crushing strength in the table.

The effect of the strength of the mortar upon the tests is apparent, and it was noticeable that the first signs of failure were usually in the mortar joints in the piers built with lime, and in the bricks in those built with cement.

In the theory of the strength of struts and pillars the coefficient of elasticity is important, but this was not ascertained in regard to the materials; in fact, in regard to bricks we can find no record of tests for this anywhere. The amount of compression of the piers was taken, however, but varied so considerably, due to differences in the conditions of construction, that little or nothing can be learnt therefrom.

The tests on short walls were impractical. The report says in reference to them: "The influence of form upon strength has to be considered, but under the ordinary or average

Strength of Solid Piers.—(Averages.)

Kind of bricks used.	Strength of whole bricks in lbs. per sq. in.	Composition of mortar.	Strength of mortar in 3in. cubes in lbs. per sq. in.				Height of Pier.	Number of courses.	Crushing strength of piers in lbs. per sq. in.				Crushing strength of short walls 2ft. 3ins. by 18ins. at 21-22½ wks.	Authority.
			at 4 wks.	at 12 wks.	at 24 wks.	at 34 wks.			8in. pier.	12in. pier.	16in. pier.	18in. pier at 3 mths. at 6 mths.		
London Stocks	1310*8	Lime 1, sand 2	94*5	135*8 13*7 wks.	244*5	438*5 36 wks.	6 0	24				161*9 195	289*9	R.I.B.A.
Do.	do.	P. cement 1, sand 4	489*2	754*7	873*4	911*1	6 0	24	1,232			232*2 305*6	611*1	Do.
Canadian flat brick (age 3 weeks).	2,400	P. cement 1, sand 3	711				0 11*6							McGill University, Canada.
Gault	2834*2	Lime 1, sand 2	94*5	135*8 13*7 wks.	244*5	438*5 36 wks.	6 0	24				340*9 336	484*4	R.I.B.A.
Do.	do.	P. cement 1, sand 4	489*2	754*7	873*4	911*1	6 0	24				276*7 466*3	798*6	Do.
Fletton	3422*2	Lime 1, sand 2	94*5	135*8 13*7 wks.	244*5	438*5 36 wks.	6 0	24				477*2		Do.
Do.	do.	P. cement 1, sand 4	489*2	754*7	873*4	911*1	6 0	24					875	Do.
Leicester Red	7,429	Lime 1, sand 2	94*5	135*8 13*7 wks.	244*5	438*5 36 wks.	6 0	24				478*1 530*7	705*6	Do.
Do.	do.	P. cement 1, sand 4	489*2	754*7	873*4	911*1	6 0	24				909*2 734*4	1,296*7	Do.
Bay State Common	11,355	Lime 1, sand 3					2 0	10		1,370				Watertown Arsenal.
Do.	do.	do.					6 0	30		1,171				Do.
Do.	do.	P. cement 1, sand 2					6 0	29		1,792				Do.
Do.	do.	Lime 1, sand 3					7 10	39		1,174				Do.
Do.	do.	co. do.					10 0	49	(8x12)	924	12x16			Do.
Blue Staffordshire	13,632	Lime 1, sand 2	94*5	135*8 13*7 wks.	244*5	438*5 36 wks.	6 0	24				1,155*7 1,145*8	1,778*6	R.I.B.A.
Do.	do.	P. cement 1, sand 4	489*2	754*7	873*4	911*1	6 0	24				1,132*4 1,285*5	2,106*6	Do.
Face (M.W. Sands, Cambridge, Mass.)	13,844	Lime 1, sand 3					1 4	7	2,520					Watertown Arsenal.
Do.	do.	P. cement 1, sand 2					1 4	7	3,776					Do.
Do.	do.	Lime 1, sand 3					2 0	10		1,940				Do.
Do.	do.	P. cement 1, sand 2					2 0	10		3,670				Do.
Do.	do.	Lime 1, sand 3					6 8	35	1,877					Do.
Do.	do.	P. cement 1, sand 2					6 8	35	2,249					Do.
Do.	do.	Lime 1, sand 3					10 0	52		1,511				Do.
Do.	do.	P. cement 1, sand 2					10 0	51		2,253				Do.
Common (M.W. Sands, Cambridge, Mass.)	18,200	Lime 1, sand 3					1 4	7	2,440					Do.
Do.	do.	do.					2 0	10		2,150				Do.
Do.	do.	P. cement 1, sand 2					2 8				2,720			Do.
Do.	do.	Lime 1, sand 3					6 8		1,40					Do.
Do.	do.	P. cement 1, sand 2					9 9			1,118				Do.
Do.	do.	Lime 1, sand 3					10 0			2,003	1,887			Do.

* London: R.I.B.A., 9, Conduit Street, Hanover Square, W., price 6s.

conditions of practice the form of brickwork does not appear very greatly to affect the strength, the 18in. piers having given approximately similar results per square foot to those obtained from specimens 27ins. by 18ins., and in a building of any considerable height the total height may generally be considered as divided by each floor. Otherwise the effect of shearing or a bending strain, however introduced, would be fatal to any walls of great height and length." The results were not approximately the same: the bonding was superior in the "walls," and this doubtless accounts for their superior strength (in the case of the blue bricks the walls were built from stronger bricks than the piers), but we have no right on such slender evidence to draw conclusions as to the strength of a wall of even short length.

We think it most important that further tests should be carried out. The by-laws as to the thickness of walls have been drawn up without any scientific basis, and the requirements are sometimes too stringent and sometimes too lax, while they differ in various places. It is of first importance to ascertain the strength of 9in. and 14in. walls, as the majority of walls are of these thicknesses. It would be comparatively easy to test them by erecting brick and stone partition walls, say, 10ft. high between outer walls of considerable thickness, with continuous joists over, resting on another joist as wall-plate on the wall under test, to distribute the load equally, and applying the load by means of pig-iron. Similar walls of 4½ins., 9ins., 13½ins., 18ins. and 22½ins. thickness, and varying in length from 5ft. to 20ft., should be tested; while if piers 9ins., 13½ins. and 18ins. were tested in various kinds of bricks up to 15ft. in height, carefully constructed under equal conditions, we should have a most valuable mass of evidence that ought to conclusively settle the question. Government and municipal authorities ought to assist in such a work.

Builders' Notes.

Employment in the Building Trades continued dull during September. It was on the whole about the same as August, but slightly worse than a year ago.

Sheffield Builders, Ltd.—On p. 151 of our issue for September 13th a paragraph stated that this company was to be wound up. Since its appearance some confusion appears to have been made by readers between the firm named—a Sheffield firm—and the well-known London contractors, Messrs. Sheffield Brothers, Downs Park Road, Dalston, N.E. We are requested, therefore, to draw attention to the matter.

The Restoration of the Proscenium Arch at His Majesty's Theatre for Mr. Beerbohm Tree has been completed by Messrs. Patman & Fotheringham, Ltd., under the supervision of Mr. Romaine Walker, the architect, earlier than anticipated. The work was carried on by night and day. Very good progress is also being made at the Avenue Theatre by Messrs. Patman & Fotheringham, for Mr. Cyril Maude.

To Prevent Strikes.—At a meeting of the Stockton Master-Builders' Association held last week (Mr. T. Hanby presiding) the scheme which had been formulated by the Master-Builders' Federation throughout the country, with the object of preventing strikes, was considered. The scheme provides that in the first instance the masters and operatives shall meet to discuss matters in dispute, and, failing a settlement, the question shall be referred to the local conciliation board. If that was unsuccessful the matter would go forward to the Northern Centre Board and finally to the National Conciliation Board. Whilst negotiations are going on there is to

be no stoppage of work. The scheme was approved by the Stockton Master-Builders, and representatives on the local conciliation board were appointed.

Southern Master-Builders' Federation.—The half-yearly general meeting of the Southern Counties Federation of Master Builders was held at Portsmouth recently, the chair being occupied by the president, Mr. F. Wallis, of Maidstone. Several important matters relating to the building trade were discussed, the chief being questions of forming a national reserve fund, a national conciliation board, and a national organization committee, for the purpose of going thoroughly into questions of finance and organization and into Parliamentary and local government matters. With regard to local building by-laws, the president said he was pleased to state that the National Federation of Building Trade Employers had agreed that the subject of codifying the building laws was important enough to have the consideration of a Royal Commission, and that the matter was receiving attention.

Keystones.

Help wanted for the Architects' Benevolent Society.—Mr. Walter Emden has offered £50 for the Architects' Benevolent Society, provided nine other gentlemen will do likewise.

Kingsway and Aldwych, opened by the King to-day, will both be lighted by high-pressure gas lamps of 700-c.p. Below the surface is the shallow tramway tunnel, to which access is given by short flights of steps at regular intervals, while below the tunnel is the tube of the Great Northern and Piccadilly Railway.

A Striking Application of Fire-resisting Material is well illustrated by the magnificent tapestries from Raphael cartoons which have lately been hung in Hampton Court Palace. These are specially protected from any risks or damage by fire, a special apparatus being attached for quickly lowering them and the backs of the panels being covered with Uralite, supplied by the British Uralite Co., Ltd.

New Library and Fire-Brigade Station at Ilford.—Plans for a public library at Ilford, Essex, have been prepared by Mr. H. Shaw, A.M.I.C.E., surveyor to the U.D.C., and tenders are to be invited. The building will be erected on a site opposite the G. E. R. station, out of a gift of £10,000 by Mr. Andrew Carnegie. The new central fire-brigade station at Ilford is nearing completion, and will be formally opened on November 9th. The estimated total cost is £8,000. The plans for this building also were prepared by Mr. Shaw.

Fire Insurance.—The intricacies of a fire-insurance policy are very little understood, most people being under the impression that they have only to pay the premium in order to be able in the event of a fire to draw the amount insured. But an insurance company will require the insurer to prepare a list of the goods destroyed and to substantiate the claim, which he can seldom do, so that an unsatisfactory compromise usually results. A special insurance valuation of the contents of the house made by some reputable firm offers a remedy, and this Messrs. Gillow, of 406, Oxford Street, London, W., are prepared to undertake, and the reputation they possess guarantees the acceptance of their valuations by the fire offices as a basis of settlement. Messrs. Gillow have recently issued an interesting pamphlet on the subject, entitled "Fire Insurance: its Defects and the Remedy," and they will be pleased to give information free of charge to any who care to communicate with them.

A new Hall for the Parish of St. Mark, West Ham, is being built at a cost of about £2,000 from designs by Mr. Henry A. Saul, architect, of London, W.C. The foundation-stone of the building was laid on Saturday last.

Liverpool Architectural Association.—The annual report of the council for the past session—the 57th—has just been issued. The present membership is given at 120. Standing by-laws necessary for the proper working of the Society, and nomination and other forms, have been published. A travelling studentship in connection with the Society is proposed to be established, and educational and professional practice committees are intended to be formed to take an active part in regard to local competitions and other matters affecting the profession. The syllabus of the present session is as follows:—October 9th, presidential address by Mr. Philip C. Thicknesse; October 23rd, "Opinions on Garden City Cottages," by various members; November 6th, Mr. A. Needham Wilson on "Sketch Plans and Working Drawings"; December 4th, Mr. E. A. Rickards on "Intention in Ornament"; January 8th, Mr. P. Scott Worthington on "The Houses of the Monks in the Middle Ages"; January 22nd, Mr. T. Rees on "Architects and the Improvement of Cities"; February 5th, Mr. C. H. Reilly on "Michael Angelo's Work at San Lorenzo and in the Sistine Chapel"; February 19th, members' meeting; March 5th, Mr. Charles Spooner on "Church Fittings."

Manchester Society of Architects: President's Address.—On Thursday last the first sessional meeting of the Manchester Society of Architects was held. Mr. J. H. Woodhouse, F.R.I.B.A., the newly elected president, in the course of his address, dealt with "new art" in architecture. This he described as a passing phase, a mere caprice of the hour. Its originality frequently became eccentricity, and would not survive the test of time. He contended it was not "new art" that was desired, but a full and thorough knowledge and appreciation of our old art, adapted to modern conditions and requirements. In support of this he quoted Ruskin: "The forms of architecture known are good enough for us and for better than any of us, and it will be time enough to think of changing them for a better when we can use them as they are." In regard to "taste" in architecture, Mr. Woodhouse suggested that in order to secure for the benefit of the citizen a higher ideal in the artistic treatment of Manchester, a small advisory committee should be appointed, formed of men of acknowledged qualification, to whom should be referred all matters of an artistic character. If this were done, he said, we should not mourn in the future as we now do over so many things that offend us. It would have pleased him to see the small plot of land in Victoria Street at the bottom of Cateaton Street retained as an open space. Thereby a public interest would have been secured in the old Hanging Bridge recently brought to light. But it was not to be, and the foundations for new buildings had already been begun. The present strong trend of the architect towards erecting city buildings in permanent coloured material was appreciatively commented upon.

Architectural Classes in Edinburgh.—The Edinburgh Architectural Association has just issued a syllabus of classes on art and technical subjects to be held in Edinburgh this coming session. The attention of practising architects is directed to those classes which their pupils and draughtsmen should attend according to their advancement in knowledge. The syllabus indicates a course of general study extending over four years, leaving a certain amount of latitude in the selection of classes. A recommendation is

subjoined strongly advising students to prepare themselves for the R.I.B.A. examination, and announcing special classes which are to be provided with that object.

The Wesleyan Central Hall at Plumstead—in High Street—was opened recently. The cost has been £21,399.

New Schools have been erected at New Tredegar and Cwmsflog, in the Rhymney Valley, from designs by Messrs. James & Morgan, F.F.R.I.B.A., architects, of Cardiff.

Restoration of Moreton Hall.—A modified form of restoration or repair, following closely on the lines of the original conception, is being carried out at Moreton Old Hall, Cheshire.

New Offices at Falkirk, for the Eastern District Committee of the Stirling County Council, have been erected at a cost of about £6,000 (exclusive of site) from designs by Messrs. A. & W. Black, architects, of Falkirk.

Mr. John T. Henshaw, M.S.A., architect, surveyor and estate agent, has taken over from Mr. Robert Neill the offices of the late Mr. Charles Parsons, at 9, Grimshaw Street, Burnley, and at Blackburn. Mr. Henshaw was formerly manager with the late Mr. Parsons.

Les Architectes en Belgique.—“Le Petit Bleu” publishes the following: “La société centrale d'architecture de Belgique a pris la résolution, dans un but d'intérêt professionnel, d'intérêt général et de propagande d'art, d'adresser à tous les pouvoirs publics une requête les invitant à décider que, dans le ressort de leur département ou juridiction, ‘tous les travaux de construction de quelque importance soient confiés à des architectes privés à désigner par voie de concours public ou restreint, ou choisis en vertu de leur talent notoire ou de leurs aptitudes spéciales.’”

Partnership.—We regret that, through a misreading of the circular sent to us, we made a mistake in the announcement of the partnership between Mr. Lionel G. Detmar, A.R.I.B.A., and Mr. Theo. Gregg at 1a, St. Helen's Place, Bishopsgate Street, E.C. Mr. Detmar was formerly in practice with his uncle, Mr. W. Hilton Nash, F.R.I.B.A., at Bush Lane House, Cannon Street, E.C., and it was on the retirement of his uncle that Mr. Detmar arranged to carry on the practice conjointly with Mr. Gregg. In the paragraph published on p. 198 of our issue for October 4th it was erroneously stated that Mr. Nash, on the retirement of his uncle, had entered into partnership with Mr. Gregg.

The Cost of restoring York Minster.—The “Occasional Papers” which the Dean of York has issued during the past five or six years describing the progress of the work of repair and restoration at the Minster have now been collected together and issued in volume form. It appears that between 1829 and 1899 the following sums were spent on restoration and rebuilding work:—

1829—Rebuilding of choir - - -	55,882
1830—Rebuilding of nave - - -	24,560
1859—Restoration of chapter-house - - -	4,200
Organ-chamber - - -	1,200
Organ nave - - -	1,000
Restoration of south transept - - -	20,000
1890—South window of choir transept - - -	610
1891—Nave roof - - -	1,200
1893—North window of choir transept - - -	572
1896—South aisle of nave pinnacles - - -	1,200
Total - - -	£110,424

In October, 1898, Mr. Bodley reported that another £50,000 would be needed to carry out the essential restoration, and that this would occupy fourteen or fifteen years. The work was undertaken, and has been carried on for five or six years on the lines recommended by Mr. Bodley, though much yet remains to be done. The total amount subscribed towards the restoration fund up to June 17th last was £22,857, and there had been expended £16,238, leaving a balance in hand of £6,619.

Viaduct for Dover.—The Dover Corporation intend to apply to Parliament for an extension of the period granted them to build a viaduct at a cost of £100,000 in connection with the maritime traffic.

Wellingborough Baptist Church has been built at a cost of £2,476 from designs by Messrs. George Baines & Son, 5, Clement's Inn, Strand, London, W.C. The builders were Messrs. E. Brown & Son, of Wellingborough.

Ayr Bridge saved for the Present.—Last week the Ayr Town Council decided to delay operations on the “Auld Brig” for four months, so as to allow the parties interested in its preservation an opportunity of providing the means of restoration and also of satisfying the council that the methods they propose will be such as to ensure permanency.

Serious Dilapidations at Winchester Cathedral.—The shoring-up of the exterior of the east end of Winchester Cathedral is now completed, but the excavations made have disclosed a serious fracture in the walls. This widens as it descends, and it is feared that it extends in a more alarming manner right to the foundations. £20,000 is needed at once for the work.

Milan Exhibition, 1906.—This exhibition is to be opened at Milan on April 15th next. It will be on a large scale and divided into ten sections. Among these will be sections dealing with wallpapers, furniture, lighting and heating apparatus, and sanitary fittings. Full particulars can be obtained from Mr. Arthur Serena, Honorary Executive Commissioner, at the office of the London Chamber of Commerce, Oxford Court, Cannon Street, E.C. The British Government has made a grant of £10,000 towards the exhibition, and it is therefore worthy of the attention of British manufacturers.

The new Chapel at St. Paul's Cathedral—the Chapel of the Order of St. Michael and St. George—was privately opened last week, although not yet completed. It is at the south-western end of the building, where Alfred Stevens's Wellington memorial formerly stood, and has been designed by Mr. Somers Clarke, F.S.A., architect to the Dean and Chapter. Teak stalls and seats for the chapel are being made and carved from the architect's designs by Mr. J. E. Knox, of 31, Upper Kennington Lane. The elaborate ironwork in some of the front seats is given by the Dean and Chapter, and is part of the original wrought work used in the choir of the cathedral. The window has been designed by the architect and made by Messrs. Powell & Sons, of Whitefriars.

“Timber and Brains.”—A paper with this title was read recently by Mr. Henry Adams, M.I.C.E., late professor of engineering at the City of London College, before the British Institute of Certified Carpenters at Carpenters' Hall. The author described the timbers that could be used in wet foundations, and gave examples of durability, followed by those that would best resist a damp situation, and then mentioned examples and exhibited specimens of durability in works above ground. The timbers best suited for marine work and for use in hot countries, to resist the attacks of worms and insects, were also mentioned. The nature of the grain of various woods, as affecting their use, was next referred to, many examples being given. The characteristics of good timber were described, the chief defects named, and the modes of preservation briefly noticed (including the new and promising Powell process). The mode of shrinkage and the alteration of shape produced during seasoning were explained, and how advantage might be taken of this knowledge. Finally, the principles of stress and strain, and the designing of beams, were described, and some useful rules were given.

New Isolation Hospital.—The Mid-Cheshire new joint isolation hospital near Davenham was opened recently. It has cost £12,000 and contains thirty-four beds for scarlet-fever and typhoid patients. This is the first joint hospital built under the compulsory order of the Local Government Board.

A new R.C. Church at Malvern has been built for the Order of Benedictines next to their monastery. It has been erected according to the last designs prepared by the late Mr. Paul Peter Pugin, the work having been carried out under the direction of Mr. Sebastian Pugin Powell. The cost has been about £7,000, the church accommodating 300 worshippers.

Vauxhall Bridge.—The work of building the new bridge across the Thames at Vauxhall is proceeding continuously, but it is not likely that it will be completed by the end of this year, according to the terms of the contract: next March or thereabouts is a more probable time. The original estimates are likely to be exceeded, as the bridge is expected to involve a total expenditure of nearly £400,000.

Bournemouth Improvements.—New municipal buildings and a town hall are proposed to be erected at Bournemouth at an estimated cost of £126,000, exclusive of furniture, &c. It is also proposed to construct an undercliff drive at a cost of about £60,000, to build a kursaal or pavilion near the pier, and to spend about £20,000 on improvements in the King's Park and Pokesdown, erecting lifts on cliffs, and constructing shelters on the pier, &c.

Restoring St. Bartholomew-the-Great.—The work of restoring the three bays of the cloisters of St. Bartholomew-the-Great, West Smithfield, is making good progress. This part of the building, which has lately been bought back, will soon be ready for opening. A free lecture on the history and architecture of the church was given on Saturday last, and another will be given on Saturday, October 28th, at 3 o'clock. No fees are charged for admission to any part of the church, but a collection is made for the work on the cloisters, which is in much need of funds.

An Atrocious House has been completed at 76, Oakley Street, Chelsea, for Dr. Phené, an eccentric antiquary with a large income. The house is in imitation of one occupied by the doctor's ancestors at Savinay, on the Loire, demolished during the Huguenot troubles. Over the door is “Renaissance du Château de Savinay.” No description would adequately convey the rest. The colour of the background is a dark red, and projecting from this are eight balconies with cream-coloured glazed columns picked out in gilt. All else is a medley of angels, gargoyles, lions and griffons, such as come in unreasonable dreams.

A new Council School at Gillingham has just been completed. Mr. J. Hatchard Smith, F.R.I.B.A., of London, E.C., was the architect, Mr. H. Harris the builder, and Mr. C. H. Langley the clerk of works. The school is built of picked yellow bricks, with red brick quoins to angles and glazed brown brick dados up to sill level. The roofs are tiled. All floors are of wood blocks on concrete, except cloak-rooms, lavatories and corridors, which are paved. Walls and ceilings are plastered with “Sirapite,” the lower portion being finished with cement, painted, and the upper part distempered: joinery pitch-pine, lightly stained and varnished. Accommodation is provided for 300 girls, 300 boys and 320 infants. The central hall plan, with classrooms around, has been adopted. The total cost of the school, including playgrounds but exclusive of desks, will not exceed £9,800, the work being carried out within the contract sum without any extras.

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :				
Oct.	19	Kendal—Works	J. Alexander & Sons	J. F. Curwen, Architect, 26 Highgate, Kendal.
"	19	London, E.—Alterations	Guardians	J. M. Knight, Architect, 35 Bancroft Road, Mile End Road, London, E.
"	19	London, E.—Nurses' Home	Guardians	J. M. Knight, Architect, 35 Bancroft Road, Mile End Road, London, E.
"	19	South Elmsall—Stores	Pontefract Industrial Society	Garside & Pennington, Architects, Pontefract.
"	19	Morchard Bishop—Farm Buildings ... ..	...	Cook & Birmingham, Land Agents, Bampton Street, Tiverton.
"	19	Leeds—Post-office	H.M. Office of Works	H. G. Nixon, H.M. Office of Works, Infirmary Street, Leeds.
"	20	Merthyr Tydfil—Cottage Homes... ..	Guardians	T. Roderick, Architect, Clifton Street, Aberdare.
"	20	Celbridge—Alterations to House... ..	Rural District Council	J. J. Inglis, Engineer, 18 Nassau Street, Dublin.
"	20	Eldwick—Residence	Mr. J. R. Grainger	W. Rhodes Nunn, Architect, 13 Market Street, Bingley.
"	23	Erith—Works at Schools	Education Committee	W. Egerton, Architect, 12 Queen's Road, Erith.
"	21	Aberdare—Houses	Building Club	Secretary, Gadlys Uchaf Building Club, Aberdare.
"	21	Gorseinon—Police-station	County Council	Glamorgan County Council Offices, Westgate Street, Cardiff.
"	21	Wakefield—Alterations	Town Council	City Surveyor, Town Hall, Wakefield.
"	21	Rettendon—Sculpture	School Managers	F. Whitmore, County Architect, 73 Duke Street, Chelmsford.
"	21	Manchester—Alterations to School	Education Committee	Education Offices, Deansgate, Manchester.
"	23	Egremont—Houses ... ..	...	J. Smith, Town Hall, Egremont.
"	23	Liverpool—Hospital	Select Vestry	E. Kirkby, Architect, 5 Cook Street, Liverpool.
"	24	Ballydonegan—Houses	Office of Public Works	Carpenter-in-charge, Queen's College, Cork.
"	24	Hoddenham—Station	Great Western & Great Central Railways Joint Committee.	Engineer's Office, Great Central Railway, Marylebone Station.
"	24	Warlingham and Whyteleaf—Alterations to School	Education Committee	Jarvis & Richards, Architects, 30 Victoria Street, Westminster, S.W.
"	25	St. Helens—Schools	Borough Council	F. S. Biran, Architect, Handshaw Street, S. Helens.
"	25	Beeston—Fire-station, &c... ..	Urban District Council	Surveyor, Public Offices, Beeston.
"	26	Lambeth—Convenience	Borough Council	H. Edwards, Engineer, 346 Kennington Road, S. E.
"	27	Lewes—Police Offices, &c.	County Council	F. J. Wood, County Surveyor, Lewes.
"	28	Maesteg—Chapel ... ..	...	Beddoe Rees, Architect, 3 Dumfries Place, Cardiff.
"	28	Thornley—Rebuilding Police-station	Standing Joint Committee	County Surveyor's Office, Shire Hall, Durham.
"	30	Claydon—Enlargement of School	Education Committee	G. W. Leighton, Architect, Princes Street, Ipswich.
"	31	Wirral—Infirmary, &c.	Guardians	J. H. Davies & Sons, Architects, Chester.
"	31	Plympton St. Mary—Enlargement of Cloakrooms	School Managers	— Gilmour, Plympton St. Mary National School, Plympton St. Mary, Devon.
"	31	Cardigan—House	Baptist Church	B. Gwynne, The Mill, St. Dogmaells.
Nov.	1	Bridgend—House	Rev. E. S. Roberts	Cook & Edwards, Architects, Masonic Buildings, Bridgend.
"	7	Mountain Ash—Houses	Cilbaul Building Club	T. W. Millar, Architect, Mountain Ash, Wales.
No date		Henbury—Police-station	County Council	County Surveyor, Shirehall, Gloucester.
ENGINEERING :				
Oct.	19	Lincoln—Water-tanks, &c.	Waterworks Committee	Neil McK. Barron, Engineer, Corporation Offices, Lincoln.
"	20	Pentre—Meter	Urban District Council	O. Thomas, Engineer, Gas and Water Offices, Pentre, Wales.
"	23	Mussoorie, India—Electric Lighting and Waterworks Scheme	Municipality	C. H. Shanani, Municipal Office, Mussoorie, India.
"	24	Blaengwynfi—Culverting	Urban District Council	W. P. Jones, Surveyor, Council Offices, Cymmer, Wales.
"	24	Ruabon—Tunnel	United Westminster and Wrexham Collieries.	W. Edwards, Engineer's Offices, Ruabon.
"	26	Amsterdam—Deepening Canal	Provincial Board of North Holland.	Gebr. van Cleef, The Hague.
"	30	Haarlem—Roof	Holland Railway Co.	Central Administration Buildings, Holland Railway Co., Room 150, Droogbak, Amsterdam.
Nov.	8	Stratton St. Margaret—Storm-water Bed	Rural District Council	Beesby, Son & Nicholas, Engineers, 11 Victoria St., Westminster.
"	9	Havana—Pier... ..	...	Cuban Consulate, London.
IRON AND STEEL :				
Oct.	19	Lincoln—Pipes, &c... ..	Waterworks Committee... ..	Neil McK. Barron, Engineer, Corporation Offices, Lincoln.
"	20	Alnwick—Pipes	Rural District Council	H. W. Walter, Clerk, Rural District Council, Alnwick.
"	24	Christiania—Steel	Norwegian State Lights and Buoys Dept.	Norwegian State Lights and Buoys Dept., Christiania.
"	25	Dublin—Rails and Chairs	Dublin, Wicklow and Wexford Railway Co.	M. F. Keogh, Secretary, Westland Row Station, Dublin.
"	31	London, S.W.—Rails	County Council	Engineer's Dept., County Hall, Spring Gardens, S.W.
PAINTING AND PLUMBING :				
Oct.	20	Keswick—Painting	Urban District Council	Surveyor, Urban District Council Offices, Keswick.
ROADS AND CARTAGE :				
Oct.	19	Southend-on-Sea—Making-up	Corporation... ..	E. J. Elford, Borough Surveyor, Southend-on-Sea.
"	23	Barking—Private Street Works	Urban District Council	C. F. Dawson, Surveyor, Public Offices, Barking.
"	23	Broadstairs—Flints	Urban District Council	H. Hind, Surveyor, Broadstairs.
"	23	Rumford—Road Material	Rural District Council	G. Lapwood, Highways Surveyor, Victoria Chambers, Romford.
Nov.	1	Arundel—Street Improvements	Town Council	A. Holmes, Town Clerk, Arundel.
No date		Clewer—Asphalting... ..	Parish Council	J. H. Strange, Clerk, 4 Victoria Street, Windsor.
"		Fairfield—Reconstruction of Street	Urban District Council	C. Flint, Surveyor, Terrace Road, Buxton.
SANITARY :				
Oct.	19	Croydon—Sewer, &c.	Rural District Council	R. M. Chart, Surveyor, Town Hall, Croydon.
"	20	Stratford-on-Avon—Sewerage Works	Rural District Council	Willox & Raikes, Engineers, 63 Temple Row, Birmingham.
"	21	Kendal—Drains, &c.	Corporation... ..	R. Hampton Chicus, Borough Engineer, Town Hall, Kendal.
Nov.	1	Wembley—Sewers	Urban District Council	W. Bagshaw, Clerk, Public Offices, Wembley.
"	9	Murton Colliery—Sewage-disposal Works	Rural District Council	C. Rule, Surveyor, Haswell, via Sunderland.

List of Competitions Open.

DATE OF DELIVERY.		DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Oct.	20	Bridlington—Concert Hall	35 and 20 guineas	—	A. E. Matthewman, Town Clerk, Bridlington.
Nov.	4	Maesteg—Chapel	—	—	W. Job, Llynir Lodge, Maesteg, Wales.
"	4	Greenwich—Library	£25, £15, £10	—	F. Robinson, Town Clerk, Greenwich.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

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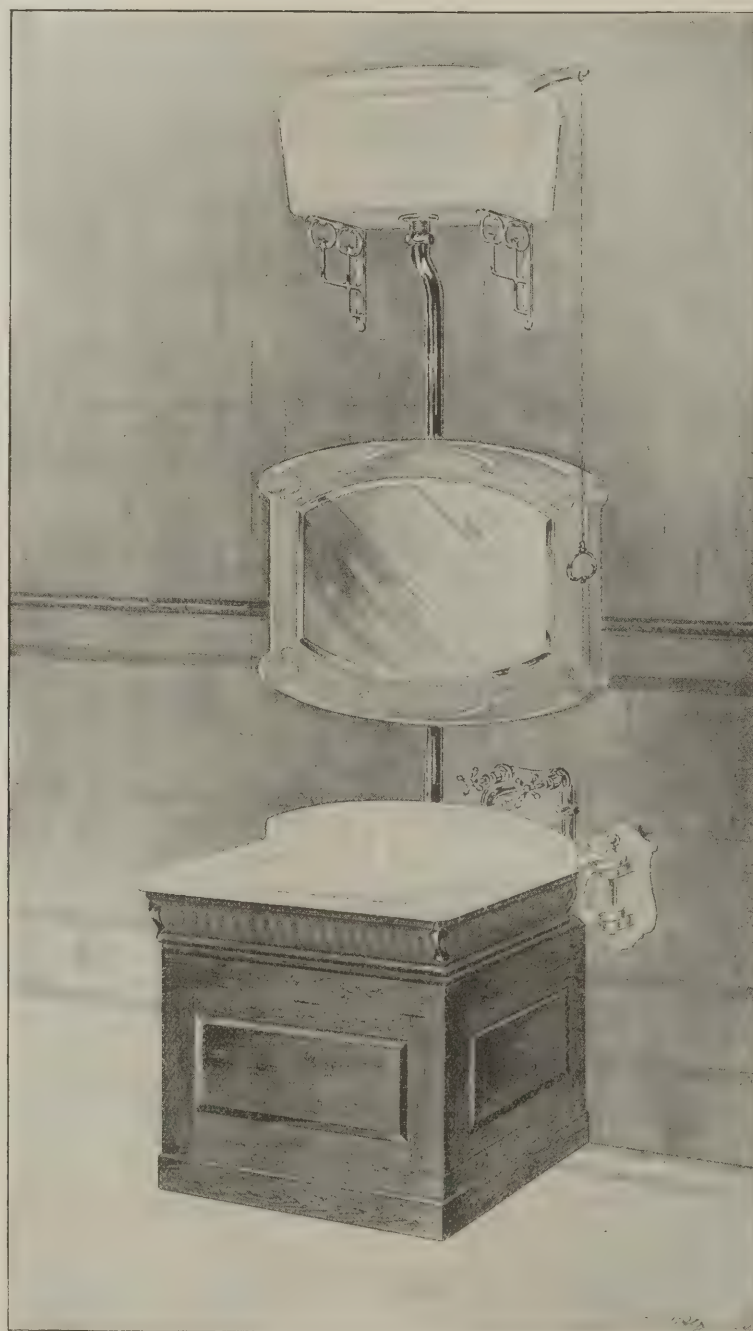
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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barrow-in-Furness.—For the erection of a receiving home and four cottage homes for children on land in Roose Road, for the Guardians. Mr. Henry T. Fowler, A.R.I.B.A., architect, Cornwallis Street, Barrow-in-Furness:—

Rainey Brothers, Barrow	£3,893	0	0
T. Brown, Hindpool Road	3,881	14	10
W. Gradwell & Co., Hindpool Saw-mills	3,852	11	9
Clark & Robinson,* Greengate Bridge	3,700	0	0
[NOTE.—Lowest combined tenders, £3,736 7s. 5d.]			
* Accepted.			

Blaina.—For the erection of new classrooms, cloak-rooms and other works at the Blaina Central School, for the Monmouthshire Education Committee. Mr. R. L. Roberts, M.S.A., architect, Abercarn. Quantities supplied:—

N. Bagley, Abertillery	£1,239	9	2
H. Smith, Kidderminster	1,220	0	0
J. Jenkins, Ltd., Newport	1,215	0	0
R. Page, Blaina	1,177	17	7
W. Jenkins,* Blaina	1,169	5	0
* Accepted. [Architect's estimate, £1,200.]			

Birmingham.—For the erection of a nurses' home at the workhouse infirmary. Mr. W. H. Ward, architect, Paradise Street, Birmingham:—

G. Robinson	£3,295		
Cole & Son	3,100		
P. Cox	3,075		
Sapcote & Sons	3,066		
G. Jackson	3,059		
E. Crowder	3,045		
J. Atkinson	3,045		
R. Fenwick	3,019		
H. Gibbs	2,992		
H. Pitts	2,987		
T. Wilkinson	2,958		
G. Webb*	2,879		
* Accepted. [All of Birmingham.]			

Bitterne.—For the erection of Bitterne Park Congregational Church, Cobden Avenue. Messrs. Lemon & Blizard, architects, Castle Lane, Southampton:—

H. Stevens & Co.	£2,838	0	0
A. Bailey	2,698	9	7
H. Cawte	2,687	0	0
Jenkins & Sons	2,570	0	0
Exors. of the late W. Franklin	2,538	0	0
J. Nichol	2,422	0	0
Dyer & Sons	2,390	0	0
W. Jupp*	2,386	0	0
H. Lawrence†	2,175	0	0
[Architect's protecting estimate, £2,300.]			
* Accepted. † Withdrawn.			

Blackburn.—Accepted for the erection of a new post-office in Darwen Street, for H.M. Office of Works:—

W. J. Woof Cronshaw & Sons	£10,000		
----------------------------	---------	--	--

Frinton-on-Sea.—For the erection of villas to be built on the Queen's Road. Mr. R. Mawhood, architect, Chelmsford:—

Baker & Sons	£1,270		
Potter & Sons	1,245		
F. Cracknell,* Chelmsford	1,200		
* Accepted.			

Great Yarmouth.—For the erection of additions to Messrs. Arnold's premises, Regent and King Streets. Quantities by architects, Messrs. Olley & Haward, Great Yarmouth:—

Main contract.			
C. Wiseman	£4,710	17	6
R. Easton	4,547	0	0
A. Davy	4,412	0	0
J. Leggett	4,367	0	0
G. T. Flaxman	4,329	0	0
Carter & Wright	4,198	0	0
I. S. Cooper	4,191	12	0
G. W. Beech	4,082	0	0
Moore & Sons	4,040	0	0
F. Grimble	3,995	0	0
J. D. Harman*	3,980	0	0

I. S. Cooper*	Shop front, &c.	£1,690	0	0
* Accepted.				

Ilkeston.—For the erection of a police-station, with a superintendent's and constable's house, stabling and mortuary, &c., in Wharncliffe Road and Albert Street, for the General Works Committee. Mr. H. J. Kilford, borough engineer:—

A. Summerfield, Derby	£5,195	0	0
J. O. Hicklin & Co.	4,789	18	0
E. L. Clayton	4,787	6	0
D. Roberts	4,760	0	0
T. Cuthbert, Nottingham	4,615	0	0
W. V. Ireson	4,611	5	0
T. Barlow & Co., Nottingham	4,586	0	0
L. Buxton	4,580	0	0
J. Wright, Nottingham	4,505	0	0
J. J. Warner, Derby	4,553	0	0
T. Fish & Sons, Nottingham	4,511	0	0
A. Earnshaw	4,430	0	0
H. Vickers & Sons, Nottingham	4,365	0	0
J. Young, Derby	4,250	0	0
G. T. Lovett,* Nottingham	4,230	0	0
* Accepted.			
[Rest of Ilkeston.]			

Isleworth.—For additions to workhouse and infirmary, for the Guardians of Brentford Union. Mr. W. H. Ward, architect, Paradise Street, Birmingham:—

H. Lovatt, Ltd.	£43,975	0	0
Enness Brothers	43,816	0	0
Wisdom Brothers	43,675	0	0
H. Knight & Son	43,523	0	0
F. Gough & Co.	43,000	0	0
T. J. Hawkins & Co.	42,943	18	3
T. J. Messom & Sons....	42,575	0	0
J. Barker & Co.	42,466	0	0
W. H. Lorden & Son....	42,168	0	0
H. Wilcock & Co.	41,987	13	0
W. Harvey-Gibbs	41,740	0	0
W. Pattinson & Sons....	41,571	0	0
C. Gray	40,624	10	0
J. Dorey & Co.	40,552	0	0
E. Wall	40,370	0	0
G. Longden & Son	39,930	9	8
C. Wall, Ltd.,* Uperne Road, Chelsea	39,595	0	0
* Accepted.			

London, E.C.—For the "first section" of a block of buildings in Cheapside. Mr. Albert E. Kingwell, architect and surveyor, 103 and 104, Cheapside. Quantities by Mr. H. Fortescue Williams:—

Tout	£4,520		
Mansfield & Sons	4,449		
Fairhead & Sons	4,236		
W. Renshaw	4,193		
W. Rowe & Co.	4,127		
J. Grover & Son	4,036		
Hunt & Sons	3,992		
Bywater & Sons	3,964		
Sims & Co.	3,950		
J. C. Richards & Co.	3,925		
Patman & Fotheringham*	3,783		
Lole & Co.	3,765		
Minter	3,760		
Waring-White Building Co.	3,749		
* Accepted. [Architect's estimate, £4,000.]			
NOTE.—Tenders do not include lift or lighting.			

Richmond.—For the erection of a public elementary school in Darell Road, for the Town Council:—

W. Gibson & Co., Hendon	£11,454		
Marriott & Salter, Caterham Valley	10,922		
F. G. Lawrence, Kingston	11,109		
W. Wallis, Balham High Road, S.W.	11,022		
J. & C. Bowyer, Upper Norwood	10,697		
W. H. Hyde, Norwood Junction	10,620		
R. Elvy, Southend-on-Sea	10,544		
J. W. Brooking, Richmond	10,471		
Speechley & Smith, Richmond	10,430		
J. & M. Patrick, Wandsworth	10,375		
Higgs & Outhwaite, Cobham	10,350		
W. Johnson & Co., Wandsworth Common	10,335		
W. J. Renshaw, Putney	10,229		
McC. E. Fitt, Reading	9,762		
W. Smith & Sons, Croydon	9,628		
S. N. Scole & Son,* Richmond	9,650		
G. H. Gibson, High Wycombe	9,335		
* Accepted.			

A.—Extra for glazed-brick dadoes.

B.—Extra for tar-paving playground.

Continued on p. xvi.

London, N.E.—For erecting the superstructure of the new administrative block at their infirmary at Homerton, for the Guardians of Hackney Union. Mr. W. A. Finch, architect, 76, Finsbury Pavement, E.C.:—

Coulson & Loft	£39,500		
Perry & Co.	36,500		
McCormick & Sons	36,285		
Lawrence & Sons	35,926		
J. F. Holliday	35,789		
Wilkinson Brothers	35,779		
Leslie & Co.	35,567		
Stapleton & Son	35,526		
F. & T. Thorn	35,300		
Thomas & Edge	35,280		
B. E. Nightingale	34,950		
J. & M. Patrick	34,839		
H. Wilcock & Co.	34,775		
Patman & Fotheringham	34,700		
Shelbourne & Co.	34,540		
Lovatt, Ltd.	34,500		
Pethick Brothers	34,444		
Shurmer & Sons	34,443		
C. Wall	34,300		
W. Lawrence & Sons	33,894		
Kirk & Randall	33,884		
H. & R. Roberts	33,699		
A. Faulks	33,396		
Johnson & Co.	33,340		
W. Pattinson & Sons	33,243		
F. E. Davey, Ltd.	32,587		
Killby & Gayford	32,331		
Kerridge & Shaw	31,972		
W. Wallis	31,948		
A. Monk,* Lower Edmonton	31,700		
* Accepted provisionally.			
[Architect's estimate, £34,000.]			

London, W.C.—For alterations, &c., and forming new Russian restaurant at 399 and 400, Strand, for Romano's, Ltd. Mr. A. Cole, architect, 34, Thurlstone Road, West Norwood, S.E.:—

General building works.			
J. Peattie	£1,727		
Creaton & Co.	1,221		
A. J. & C. Hocking*	1,078		
Decorative joinery.			
McKenzie & Co.	312		
Hewetsons, Ltd.	230		
Fire Prevention Building Co.*	178		
L. T. Allen	125		
* Accepted.			

London, N.E.—Accepted for the erection of three villa residences at Wanstead. Mr. Herbert Riches, architect, 3, Crooked Lane, King William Street, London, E.C.:—

Clemens Brothers	£1,940		
St. Albans.—For the erection of a residence in Hall Place Gardens, for Mrs. Langridge. Mr. Henry F. Mence, architect, Town Hall Chambers, St. Albans:—			
E. Dunham, St. Albans	£1,565		
C. Miskin & Sons,* St. Albans	1,558		
* Accepted.			

Wimbledon.—For completing Nos. 4 and 5, Parkside. Messrs. Homer & Lucas, architects, 35, Bucklersbury, E.C. Quantities by G. Silvester, 45, Strand, W.C.:—

Larke Brothers, London	£1,696		
A. Hudson,* Westminster	1,435		
Hammond, Battersea	1,429		
* Accepted.			

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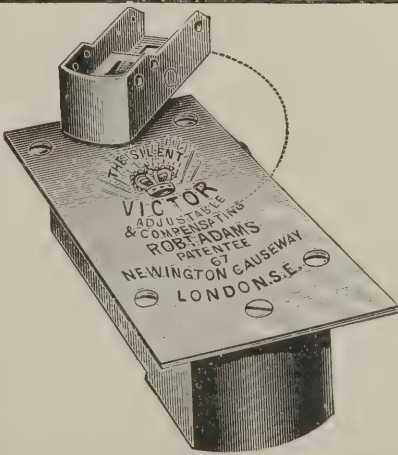
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SURVEYOR, with 14 years' experience, wishes to take PARTNERSHIP in Surveyor's and Estate Agent's business, or would purchase small business.—Apply Box 1379, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The FINAL and SPECIAL EXAMINATIONS will be held from the 17th to the 24th NOVEMBER, 1905 (inclusive).

Applications, accompanied by Testimonies of Study, etc., and the necessary fees, should be sent in on or before the 21st OCTOBER, addressed to the undersigned.

W. J. LOCKE,
Secretary, R.I.B.A.

No. 9, Conduit Street, London, W.

THE ARCHITECTURAL ASSOCIATION.

October 20th. Ordinary General Meeting at 18, Tufton Street, Westminster, S.W., at 7.30 p.m. Paper on "The Ecclesiastical Architecture of the City of London" (illustrated with lantern views), by Mr. Andrew Oliver.

October 21st. By kind invitation of Sir Aston Webb, R.A., a visit will be paid to the Victoria and Albert Museum on Saturday, October 21st. This building is now in a very interesting stage, and the sculptors have been invited to be in attendance. Members to meet at the Clerk of Works Office in Cromwell Road, at 2 p.m.

HENRY TANNER, JR., } Hon. Secs.
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EMPLOYMENT REGISTER.

Too late for Classification.

- 1437.—ARCHITECT AND SURVEYOR'S ASSISTANT, young; assist with contract and competition drawings in spare time, surveys; 10 years' London exp.
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- 1443.—BUILDER'S CLERK; 25 yrs. exp. of West-end trade; general knowledge, trustworthy; 1st class refs.; mod. s.

See p. xx for the Employment Register.

Contracts Open.

BOROUGH OF TUNBRIDGE WELLS.

TO ROAD CONTRACTORS.

PRIVATE STREET WORKS.

The Council of the Borough are prepared to receive TENDERS for the Paving, Metalling, and Making-up of Manor Road, Erskine Park Road (part of), Hillview Road, and Meadow Road.

Plans, sections, and specifications can be seen, and copies of the bill of quantities obtained, at the office of the Borough Engineer and Surveyor (Mr. W. H. MAXWELL, A.M.I.C.E.), Town Hall.

The person or firm whose tender is accepted will be required to enter into a contract and bond, with two approved sureties, for the due performance of the Contract.

Tenders, endorsed "Private Street Works," to be sent to me on or before FRIDAY, the 27th OCTOBER, 1905, at 9 a.m.

The Corporation do not bind themselves to accept the lowest or any Tender.

Town Hall,
Tunbridge Wells,
13th October, 1905.
By order,
W. C. CRIPPS,
Town Clerk.

ISLE OF ELY EDUCATION COMMITTEE.

TENDERS are invited for the ERECTION at March of a block of ELEMENTARY SCHOOLS to accommodate 600 boys and girls.

Those desirous of Tendering are requested to send their names and addresses to the undersigned not later than OCTOBER 18th, 1905, with a deposit of five guineas (by cheque payable to the order of the Isle of Ely County Council), which will be returned on receipt of a bona fide Tender.

Quantities (supplied by Mr. F. T. MULLETT, Cambridge) will be forwarded with a notification when drawings and specification can be inspected.

The Committee do not bind themselves to accept the lowest or any Tender.

R. S. W. PERKINS,
County Surveyor.
Common Road, Ely, Cambs.
October 7th, 1905.

TO BUILDERS AND CONTRACTORS.

TENDERS are invited for the ERECTION of 61 HOUSES, for the Gadjys Uchaf Building Club, Aberdare. Plans and specifications may be seen and all particulars obtained at the offices of the Secretary.

Tenders, sealed and endorsed, to be sent to the SECRETARY, Mr. T. D. Williams, Accountant, to Canon Street, Aberdare, on or before the 21st day of OCTOBER, 1905. The lowest or any tender will not necessarily be accepted.

EAST SUSSEX COUNTY COUNCIL.

TO BUILDERS.

TENDERS are invited for the ERECTION of new POLICE OFFICES and SUPERINTENDENTS' HOUSES and ALTERATIONS to the existing BUILDINGS at Lewes, for the East Sussex County Council.

Plans, specification, and conditions of Contract may be seen, and bills of quantities obtained, after FRIDAY, 6th October next, on application to Mr. F. J. WOOD, County Surveyor, Lewes, between the hours of TEN a.m. and FOUR p.m. (Saturdays Ten a.m. and One p.m.), on payment of a deposit of three guineas, which deposit will be returned upon the receipt of a bona fide Tender.

The contractor whose Tender is accepted will be required to enter into a Contract with the County Council and, if required, enter into a bond with two approved sureties for the due carrying out of the Contract.

Tenders, endorsed "Tender for New Police Offices and Superintendents' Houses," to be addressed and delivered to the undersigned at the County Hall, Lewes, not later than TEN a.m. on FRIDAY, 27th OCTOBER, 1905.

The County Council does not bind itself to accept the lowest or any Tender, and will not pay any expenses in connection with the preparation thereof.

F. MERRIFIELD,
Clerk of the County Council.
County Hall, Lewes,
12th September, 1905.

Property & Land Sales.

TEN ACRES of FREEHOLD BUILDING LAND for £450. Gravel subsoil, within five miles of a county town, railway station 45 minutes from London; capital speculation for good class bungalows.—Write GINN, Tonbridge.

Some claims paid under "The Builders' Journal" Insurance Schemes.

The ease with which an accident happens, and the heavy expense often incurred by doctors' bills and loss of occupation are subjects that every thoughtful man has to consider, and for a Regular Reader of THE BUILDER'S JOURNAL there is no better method of protection than one of the Insurance policies issued by this paper. The following list is interesting, as it gives particulars of some of the claims that have been paid under the BUILDERS' JOURNAL Insurance Schemes.

Builder.—Injury to left arm necessitating amputation. £750.

Architect.—Slipped down steps while carrying bicycle. £6.

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Architect.—Trod on rusty nail, which entered toe. £4 10s.

Architect.—Slipped on floor, and in falling struck arm of chair. £1.

Builder.—Injured face, left eye, and foot. £6.

Only subscribers to the BUILDERS' JOURNAL are entitled to benefit under our Insurance Schemes, which are guaranteed by "The Ocean Accident and Guarantee Corporation, Limited." A pamphlet giving particulars will be sent on request, and every subscriber should avail himself of one of the following Three Schemes of Insurance.

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TENDERS—cont. from p. xiii.

Shepton Mallet.—For the erection of a new infants' school, for the Somerset County Council. Mr. Arthur J. Picot, A.R.I.B.A., architect, Bruton, Somerset:—

Brown & Sons, Bournemouth	£3,890	0	0
Thomas Lydford, Castle Cary	3,589	4	0
W. E. Bennett, Plymouth	3,447	0	0
A. E. Denby & Co., Bristol	3,399	0	0
J. Long & Sons, Bath	3,293	0	0
Dodmead & Son, Shepton Mallet	3,199	0	0
E. Chancellor & Sons, Bath	3,192	0	0
R. J. Stead, Glastonbury	3,097	10	0
William Clark & Sons, Bruton	3,066	12	0
Shepton Mallet Coal and Builders Supply Co.*	2,741	11	5

* Accepted.

St. Albans.—For the erection of six cottages, for the Trustees of St. Peter's Charities. Mr. Henry F. Mence, architect, Town Hall Chambers, St. Albans. Quantities by Mr. W. H. Smith, 5, Great Winchester Street, E.C.1:—

H. J. Skelton	£2,690		
C. Miskin & Sons	2,545		
J. Jarvis & Sons, London	2,396		
Vail & Williamson	2,379		
Boff Brothers	2,376		
F. W. Stanley	2,284		
J. Foot	1,889		
E. Dunham	1,644		
J. Hammond & Sons*	1,610		

* Accepted. [Rest of St. Albans.]

Uxbridge.—For the erection of a square brick water-tower, 48ft. high to tank level, on Uxbridge Common, and six months' maintenance, for the Urban District Council:—

W. J. Taylor & Co., Walworth	£2,024	12	0
J. Riley, Gloucester Road, Cheltenham	1,817	2	1
S. Wood, Keynsham	1,738	4	11
J. Ward & Son, Uxbridge	1,472	0	0
W. H. Randall & Son, Uxbridge	1,600	15	6
Pethick Brothers, Victoria Street, S.W.	1,595	0	0
Davies, Ball & Co., Sheerness	1,586	0	0
F. Deacon & Son, Addlestone	1,546	0	0
A. E. Rigby, Ashford, Kent	1,525	0	0
J. & W. Drake, London, W.	1,501	11	0
A. E. Nunn, London, E.C.	1,547	15	6
H. E. Willis, Southall	1,462	9	5
A. H. Ball & Co., Maidstone	1,442	17	7
Smith & Co., Westminster	1,393	13	2
J. W. Dean, Ltd., Chancery Lane	1,356	5	4
G. Chesswass, Isleworth	1,310	0	0
Chambers Brothers, Ealing	1,270	0	0
C. H. Hunt & Son, High Wycombe	1,247	0	0
G. H. Gibson, High Wycombe	1,223	0	0
Radford & Greaves, Derby	1,068	1	6

* Accepted.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending October 13th twenty-five failures in the building and timber trades in England and Wales were gazetted.

P. S. HOWARD, builder, Charlton. Adj. Oct. 4th.
C. G. TOWNSEND, builder, Deal. R.O. Oct. 5.
J. SAXON, plumber, Hucknall Torkard. R.O. Oct. 6th.
H. VIDLER & Co., builders, Surbiton. R.O. Oct. 3rd.
BONSEY & BAIGENT, builder, Hershham and Walton-on-Thames. R.O. Oct. 4th.
R. PAYNE, builder, Wanborough. P.E., Swindon C.C., Oct. 25th, at 2.30.
HAND BROTHERS, plumber and decorator, King's Norton. Adj. Oct. 7th.
F. S. PENNY, builder, Northfield. P.E., Birmingham C.C., Nov. 15th, at 2.
G. H. WRAY, builder and contractor, Harrogate. Liabilities £606; assets £146.
T. NIXON, builder, London, E.C. Unsecured debts £848; debts fully secured £2,884; assets £1,316.
H. W. BINES, plumber and decorator, Gillingham. Adj. Oct. 5th.
S. CUTLER, painter and decorator, &c., Bournemouth. P.E., Poole Town Hall, Nov. 15th, at 11.30.
J. WILLIAMS, builder, contractor, &c., Swindon. P.E., Swindon C.C., Oct. 25th, at 2.30.
J. W. DENTON, journeyman joiner, late builder, Hull. P.E., Hull C.C., Oct. 23rd, at 2.
H. WARRINGTON, painter and paperhanger, Cawood. P.E., York Courts of Justice, Nov. 3rd, at 11.
W. B. ASHBY, builder, Derby. P.E., Derby C.C., Nov. 4th, at 11.
A. E. LYDFORD, builder, late of Horfield, Bristol. First meeting, O.R.'s, Bristol, Oct. 18th, at 11.30. P.E., Bristol Guildhall, Oct. 27th, at 12.
T. H. COTTON, carpenter, Southsea. First meeting, O.R.'s, Portsmouth, Oct. 19th, at 3. P.E., Portsmouth C.C., Oct. 30th, at 11.
W. HOLT, builder and contractor, Swinton (Cheetham, Manchester). First meeting, O.R.'s, Manchester, Oct. 18th, at 3.30. P.E., Manchester C.C., Oct. 23rd, at 10.
T. E. EDMUNDS, builder, Saltley, Birmingham. First meeting, 191, Corporation Street, Birmingham, Oct. 18th, at 11. P.E., Birmingham C.C., Nov. 15th, at 2.
J. H. HODKIN, joiner and builder, Sheffield. First meeting, O.R.'s, Sheffield, Oct. 19th, at 11.30. P.E., Sheffield C.C., Oct. 19th, at 2.

Coming Events.

Wednesday, October 18.

INSTITUTE OF SANITARY ENGINEERS.—Mr. Aldons on "Ventilation of Buildings," at 7 p.m.

Thursday, October 19.

CARPENTERS' COMPANY.—Mr. H. D. Searles-Wood, F.R.I.B.A., on "Properties and Qualities of Building Materials and how to use them," Carpenters' Hall, London Wall," at 7.30 p.m.
SOCIETY OF ARCHITECTS.—Anniversary Meeting at 8 p.m.

Friday, October 20.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. W. H. Goodyear on "Architectural Refinements," at 4 p.m.
GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. T. L. Watson on "Italian Art," at 8 p.m.
ARCHITECTURAL ASSOCIATION.—Mr. Andrew Oliver on "London City Churches," at 7.30 p.m.
INSTITUTION OF MECHANICAL ENGINEERS.—General Meeting at 8 p.m.

Saturday, October 21.

GLASGOW TECHNICAL COLLEGE SCIENTIFIC SOCIETY.—Mr. H. Dyer on "The Training and Work of Engineers in some of their wider Aspects," at 7.30 p.m.

Monday, October 23.

LIVERPOOL ARCHITECTURAL SOCIETY.—"Opinions on Garden City Cottages," by various members.

Tuesday, October 24.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. W. H. Goodyear on "Architectural Refinements," at 4 p.m.

Thursday, October 26.

CARPENTERS' COMPANY.—Dr. A. Wynter-Blyth on "The Sanitary Arrangements of Buildings, &c.—I.," Carpenters' Hall, London Wall, at 7.30 p.m.

Friday, October 27.

UNIVERSITY COLLEGE.—Mr. D. S. MacColl on "Sculpture—Medieval, Renaissance and Modern," at 4.30 p.m.
JUNIOR INSTITUTION OF ENGINEERS.—Annual General Meeting and First Meeting of the Incorporated Institution, Westminster Palace Hotel, at 8 p.m.

Tuesday, October 31.

UNIVERSITY COLLEGE, LONDON.—Professor E. A. Gardner on "Architectural Sculptures."

Thursday, November 2.

CARPENTERS' COMPANY.—Dr. A. Wynter-Blyth on "The Sanitary Arrangements of Buildings, &c.—II.," Carpenters' Hall, London Wall, at 7.30 p.m.

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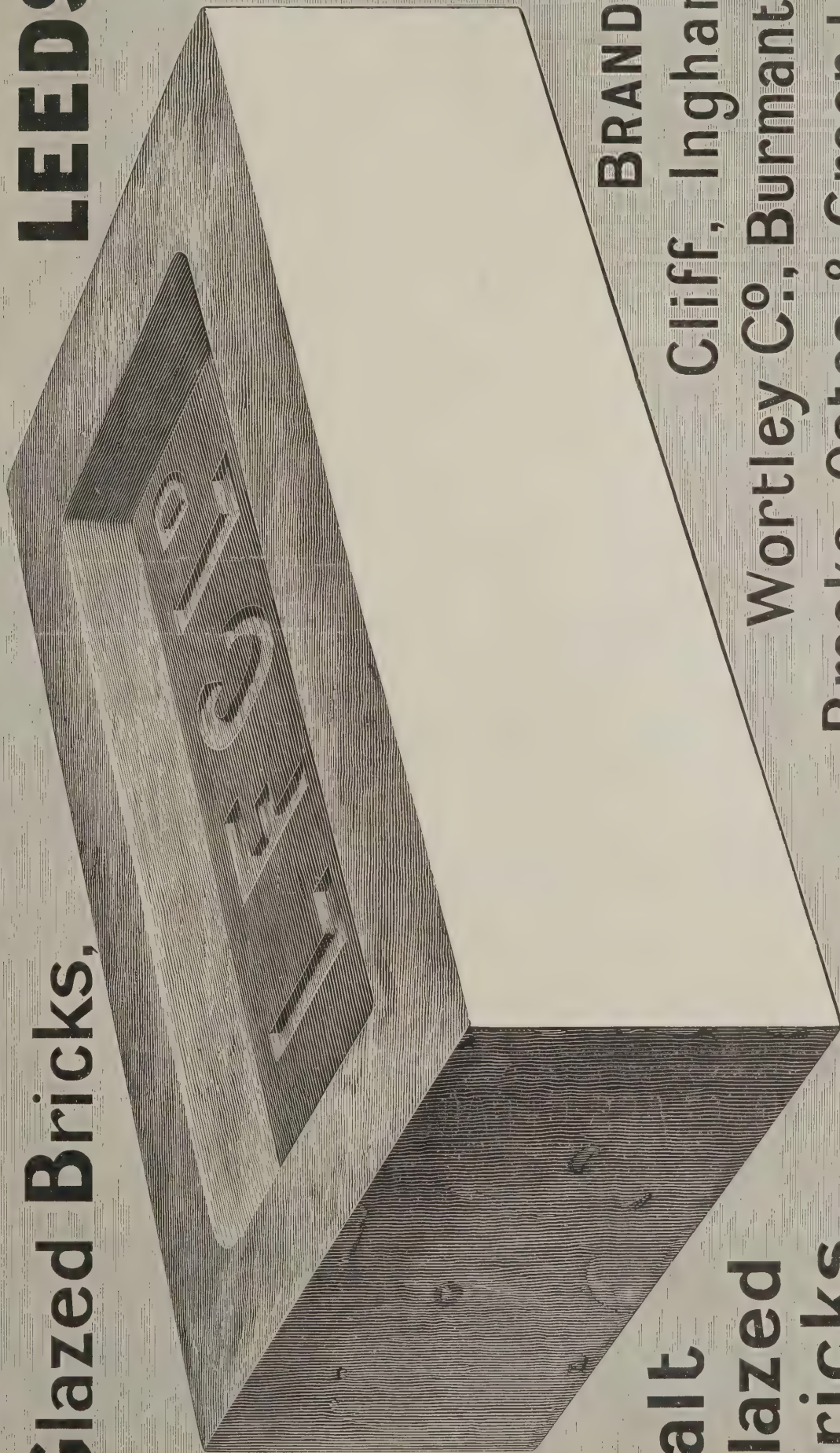
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Hay, good	do.	3 3 0	3 10 0
Sainfoin mixture ...	do.	3 7 0	3 15 0
Straw	do.	1 10 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1 3 11	1 6 3
Colza Oil, English ...	do.	1 3 3	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 15 0	2 17 0
Lead, white, ground, carbonate ...	per ton	16 0 0	—
Do. red	do.	15 0 0	0 19 0
Linseed Oil, barrels ...	per cwt.	0 16 10½	—
Petroleum, American ...	per gal.	0 0 6½	0 0 7
Do. Russian	do.	0 0 6½	0 0 6½
Pitch	per barrel	8 0 0	—
Shellac, orange	per cwt.	8 19 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Town	per cwt.	1 4 0	1 5 6
Tar, Stockholm	per barrel	1 5 0	—
Turpentine	per cwt.	2 11 0	—

METALS.

Copper, sheet, strong ...	per ton	85 0 0	—
Iron, Staffs., bar ...	do.	6 10 0	8 0 0
Do. Galvanized Corrugated sheet ...	do.	11 5 0	12 0 0
Lead, pig, Soft Foreign ...	do.	14 17 6	—
Do. do. English common brands ...	do.	15 2 6	—
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	15 0 0	—
Do. pipe	do.	16 0 0	—
Nails, cut clasp, 3in. to 6in. ...	do.	9 5 0	—
Do. floor brads	do.	9 0 0	—
Steel, Staffs., Girders and Angles ...	do.	6 5 0	6 12 6
Do. do. Mild bars ...	do.	6 5 0	6 10 0
Tin, Foreign	do.	147 5 0	147 15 0
Do. English ingots ...	do.	149 0 0	150 0 0
Zinc, sheets, Silesian ...	do.	30 17 6	—
Do. do. Vielle Montaigne ...	do.	31 0 0	—
Do. Spelter	do.	28 5 0	28 10 0

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Fir, Dantzic and Memel	per load	£ s. d.	£ s. d.
Pine, Quebec, Yellow ...	do.	4 0 0	5 0 0
Do. Pitch, American	do.	3 3 0	5 0 0
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Deals, Nederkalix, Yellow, 2nd, 4x11	per std.	9 15 0	—
Do. do. do. 3x5	do.	7 5 0	—
Do. do. do. 3rd, 3x8	do.	7 5 0	—
Do. do. do. 2½x7	do.	7 5 0	—
Do. Mesane, White, 2nd, 3x11	do.	10 5 0	—
Do. Archangel, Yellow, 1st, 3x9	do.	19 10 0	—
Do. do. do. 2nd, 3x9	do.	14 15 0	—
Do. do. do. 3rd, 3x11	do.	16 0 0	—
Do. do. do. 3rd, 3x9	do.	9 10 0	—
Do. Quebec, Bright Pine, 5th, 3x11	do.	7 10 0	—
Do. Skonirk, Yellow, 5th, 3x9	do.	6 0 0	—
Do. Salsaker, Yellow, 5th, 3x9	do.	7 10 0	—
Do. Swartwik, Yellow, 3x9	do.	6 0 0	—
Do. Sundswall, Yellow, and White, 5th, 3x9	do.	6 5 0	—
Do. Uivik, Yellow, 5th, 3x9	do.	6 5 0	—
Do. Fingermanholmen, Yellow, 3x9	do.	5 15 0	—
Do. Skelleftea, Yellow, Unsorted, 3x9	do.	7 0 0	—
Do. do. do. 3x7	do.	7 5 0	—
Do. St. Petersburg, Yellow, 3rd, 2½x7	do.	8 0 0	—
Do. do. do. 2½x7	do.	8 10 0	—
Battens, all kinds ...	do.	6 15 0	13 0 0
Flooring Boards rin. prepared, 1st ...	per square	0 9 9	0 10 9
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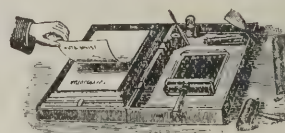
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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

October 25, 1905. Vol. 22, No. 559.

6, Great New Street, Fetter Lane, E.C.

Summary.

At last week's meeting of the Architectural Association Mr. Andrew Oliver read a paper on "Ecclesiastical Buildings in the City of London." Speaking of Wren's churches, he said there was no city which showed such variety in its towers and spires, and all these might be said to be due to the genius of one man. Of the extensive monastic establishments which once existed, all that remained was the chancel of St. Bartholomew, Smithfield, and part of the cloister of the church of St. Helen, Bishopsgate, the nave of the church of the Austin Friars, part of the Charter House, the gateway, crypt and the nave of the Priory of St. John, Clerkenwell, and the Temple Church. (Page 239.)

Mr. Claude Bragdon elaborates some interesting theories about the persistence of the triangle in architectural design, and makes deductions in regard to the relations existing between musical ratios and architectural proportions. (Page 233.)

Mr. A. E. Pridmore is the new president of the Society of Architects. The financial condition of the Society is sound, the reserve fund now standing at £1,100. (Page 238.)

No successor has yet been appointed to the late Count Sacconi, the selected architect of the memorial to King Victor Emmanuel II. at Rome. It is more than twenty-five years since the Italian Parliament decided on the erection of this memorial, the cost of which down to the end of last year was about £750,000. It is still far from completion. (Page 238.)

Attention is called to the confusion which often exists in the public mind between estimates of probable cost and actual tenders for building. (Page 241.)

In America the heating of schools by hot air has been almost entirely superseded by steam and hot water, combined with fan ventilation. Temperatures, however, are kept very high—as high as 70 degs. Fahr.—though it must not be forgotten that the percentage of humidity in the air is small compared with this country, and most people find that 70 degs. is not more comfortable in America than 60 degs. in England. (Page 244.)

In a case heard at the City of London Court recently the judge decided that a clerk of works was entitled to a month's notice. (Page 242.)

A saving of £15,874 has been made on the building of Hollymoor Asylum, Birmingham. Only on incidental expenses was the estimate exceeded and then only by £1,329. (Page 242.)

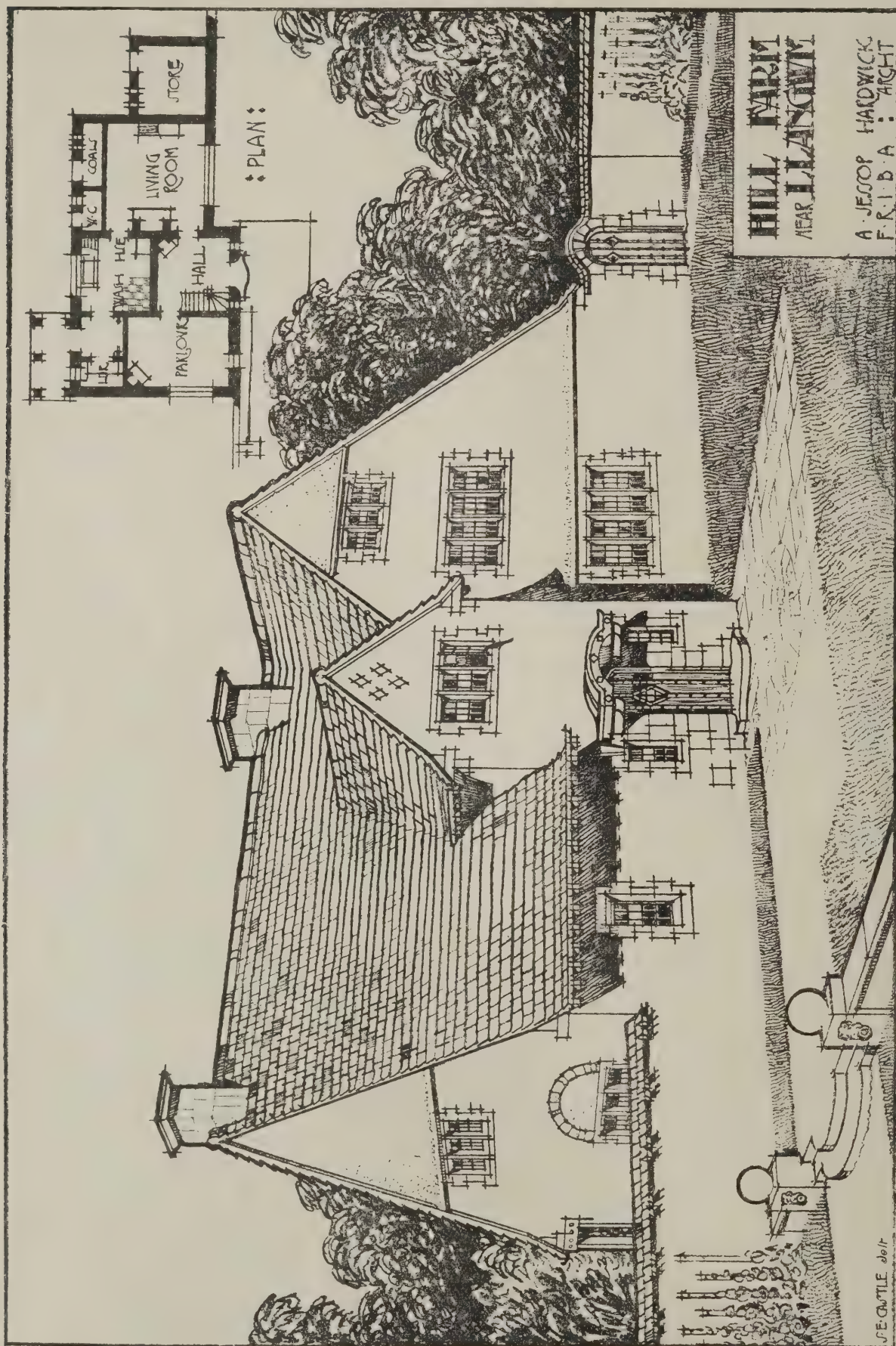
Mr. Goodyear has begun his series of lectures on architectural refinements, at Edinburgh. (Page 238.)

Quick Building.

MODERN commercial needs necessitate the erection of buildings at a rapid rate, much more so than was ever required in the past. Every day the building trade is being asked to do more and more in a certain time. Rapid building requires the quick delivery of materials, and unless these can be obtained more readily, and in larger quantities than at present, progress in the rapid construction of buildings will be hampered. A distinguishing feature of practice in the United States is that contractors can obtain almost any quantity of materials in a short time by going to large yards or manufacturing employments many hands: that is to say, the work is concentrated into comparatively fewer but larger firms. In this country there are very few stoneworking yards in large towns which could supply stone in big enough quantities to enable a large building to be rapidly erected. It would be impossible, for instance, to put up a building such as the Government offices in a year or two, whereas buildings of similar magnitude are continually being erected in the United States in this time. It is the same with other materials. Even iron and steel—commodities in which the engineering trades of this country have been for long concerned—cannot be obtained in large and regular deliveries. It is one of the drawbacks that the supply cannot be depended upon. The delivery is very fitful, while the railway facilities are equally behindhand. Our small trucks are very inferior in comparison with the large freight cars used abroad. This means that we cannot have stone, for instance, worked at the quarries, and so be enabled to assemble large quantities from a number of firms, as the buffering that occurs on our railways with such small cars, and their inadequate construction, injures any delicate goods. Thus stone with elaborate detail has to be worked in the town and delivered by carts or motor vans. The railway system being as it is, we cannot expect to obtain quick building by obtaining goods in large quantities from a number of manufacturers, and for the future it means that if we are to be able to have buildings erected rapidly there must be larger firms with greater facilities for the supply of materials. Whether these can be obtained by the combination of existing firms or by the influx of men who appreciate the need, and are willing to supply it, remains to be seen, but there is no doubt that we require greater efficiency in this as well as in other branches of the building industry. Quicker work would not mean sweated labour, but that every man would be in employment and that the earning capacity of the nation would be greater.

Rebuilding Westminster.

THE rebuilding of London seems to be proceeding apace. Within the last few years many large enterprises have been embarked upon, and our streets are already presenting a new aspect—an aspect which, we think, all will recognize as an improvement on the earlier flat-fronted later Georgian and early Victorian era, and the subsequent reign of terra-cotta with overloaded ornament. The latest rebuilding scheme for London deals with a portion of Westminster where residential houses of the well-to-do have been turned into tenements and slums. At yesterday's meeting of the London County Council the Improvements Committee reported with reference to the letting of the surplus lands connected with the Westminster improvement scheme at present being carried out that an advantageous offer had been made by a company registered as the Victoria Embankment Contract Syndicate (Ltd.) for a lease of the whole of the surplus land. Negotiations which had been carried on had resulted in the syndicate offering terms which the committee had no hesitation in advising the Council to accept. It had been agreed, subject to the Council's approval, that the syndicate should pay an ultimate ground rent calculated at the rate of 4 per cent. per annum on the total gross cost of the improvement, including the cost of the purchase of property and compensation, the provision of rehousing accommodation, and paving, &c., works. The syndicate stated that they proposed to erect, in brick or stone, buildings of fine architectural character. The expenditure in erecting the buildings on the Council's land and on the additional land was estimated at £2,500,000, so that the Council would have full security for its ground rent. Moreover, as about one-third of this sum would be spent in wages, it was apparent that constant employment during the next few years would be afforded to a considerable number of workmen. The Council would retain full control over the lines of frontage and also over the architectural treatment of the buildings to be erected, the plans being submitted for approval in the usual way. The committee think that the fact that so large an undertaking is to be executed on this improvement will have a beneficial effect on the disposal of the valuable surplus land in Kingsway and Aldwych. The report further stated that the syndicate desired that powers should be sought over the property to the west of the area of the improvement included in their scheme of 1898, but not included in the Council's scheme sanctioned by Parliament in 1900. The acquisition of this land, which will cost about £550,000, will be dealt with in a Bill to be promoted by the syndicate.



This house is a few miles on the road to Usk (Mon.) and has recently been completed. The walls are built of local stone covered with white rough-cast, and the roofs have red Bridgewater tiles. Where stone is revealed externally is Forest of Dean grey stone. Most of the external woodwork is oak, kept its natural colour. The gutters and down-pipes are painted black, and the whole of the details were kept very simple with a view to economy. The contractors were Messrs. E. Turner & Sons, of Cardiff, and the architect was Mr. A. Jessop Hardwick, F.R.I.B.A., of Kingston-on-Thames. The iron casements and leaded glass were supplied by Messrs. George Wragge, Ltd., of Manchester.

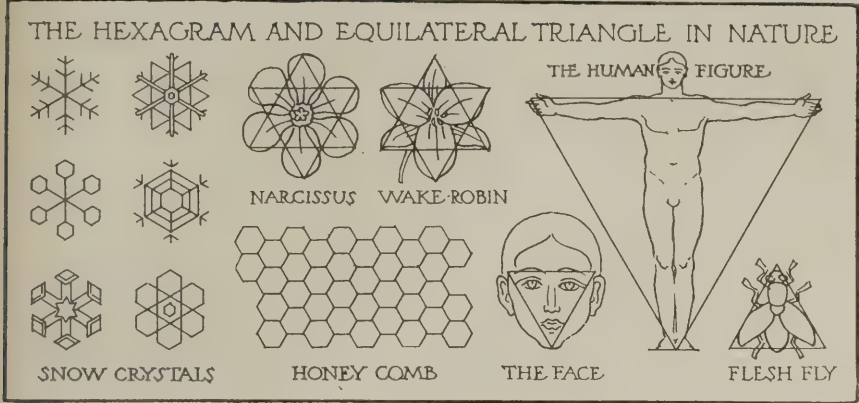


FIG. 1.

NEW THEORIES OF ARCHITECTURE.—I.

SOME little time ago an American writer, Mr. Claude Bragdon, subsequent to an address on "Mysticism and Architecture" which he delivered before the third annual convention of the Architectural League of America, wrote a series of essays elaborating the theories which had been set forth in his address. These theories may or may not be approved by the reader, but at any rate they are interesting, and we propose therefore to give them in this and a second article, these constituting the substance of the essays referred to above. The essays, six in number, originally appeared in our American contemporary "House and Garden," from which the accompanying illustrations are taken as representative of the whole series published.

The Argument.

Walter Pater has said that all art constantly aspires towards the condition of music. This is perhaps because all art has its root in number, being in one of its aspects only a system of harmonious numerical ratios, of which music is the direct sensuous expression. Everything in its last analysis is number; and geometry is the manifestation of number in space. The ancient Pythagorean precept and the latest generalization of modern science meet here on common ground.

When ideas enter phenomenal life they assume perforce a threefold aspect. They appear as cause, operation and effect; or they take on the three dimensions of length, breadth and thickness. Of this number three, an equilateral triangle, the simplest of symmetrical plane figures, is the geometrical equivalent; and if this pair, one of the two symbolizing time and the other symbolizing space, be represented by means of intersecting equilateral triangles, forming a hexagram, the resultant figure is that ancient, beautiful and mystic symbol popularly known as Solomon's Seal, or the Shield of David.

It appears that this, the equilateral triangle, taken singly, doubled, and in the form of the regular hexagon, is one of nature's archetypes, or universal patterns, for it occurs in the snow-crystal, in the bee's cell, in flower forms without number, and it can be traced—though more obscurely—in insect and animal structure, and even in the body of man himself.

It is not surprising that a figure of such significance in nature is of importance also in art, for art is "idealized creation"—nature carried to a higher power by reason of its passage through a human consciousness. According to Schopenhauer, it is possible to resolve all music into two chords, the dominant seventh and the tonic: one of longing and striving, and the other of rest and fulfilment. These are to be conceived of as the interlaced equilateral triangles of harmony, for three is the least

number of notes of which a chord can be composed, as it is the least number of lines with which it is possible to enclose a space. The hexagram of colour is more familiar, consisting, as it does, of the three primaries—red, yellow and blue, and the three secondaries—orange, green and purple. Three colours are required to form the chord, which comprises any given colour and its complement; one of the two being, of course, a binary.

The important part played by the equilateral triangle in the art of painting can be little more than suggested within the limits of this article, but any interested reader can easily pursue the subject for himself.

The problem which pre-occupied the painters of the Italian Renaissance was, as Symonds says of Leonardo, "to submit the freest play of form to simple figures of geometry in grouping." Alberti held that the painter should above all things have mastered geometry; and it is known that the study of perspective and kindred subjects was widespread and popular. The first artist to achieve a thoroughly scientific scheme of composition, based on geometrical principles, seems to have been Fra Bartolommeo, in his Last Judgment, in the church of S. Maria Nuova, in Florence. Symonds says of it: "Simple figures—the pyramid and the triangle, upright, inverted and interwoven like the rhymes of a sonnet—form the basis of the composition. This system was adhered to by the Frate in all his subsequent works." Raphael, with that power of assimilation which distinguishes him among men of genius, learned from Fra Bartolommeo this method of disposing figures, and combining them in masses with almost mathematical precision, and the equilateral triangle was one of his favourite devices.

Architecture is the most closely related of all the arts to geometry. Indeed, in a certain sense, architecture is geometry made concrete and ponderable. As Emerson says: "The pleasure a palace or a temple gives the eye is that an order and method has been communicated to stones, so that they speak and geometrize, become tender or sublime with expression." Over and above its obvious geometry, every truly great and beautiful work of architecture is harmoniously proportioned, both as a whole and as to its parts, by reason of these being in a manner co-incident with certain simple symmetrical figures of geometry. These, though invisible to the sight and not consciously present in the mind of the beholder, serve to co-ordinate the entire fabric into one memorable whole. Chief among such figures, by reason of its peculiar properties and perfection, is the equilateral triangle. It would seem that the eye has an especial fondness for this figure, just as the ear has for certain related musical sounds. It may

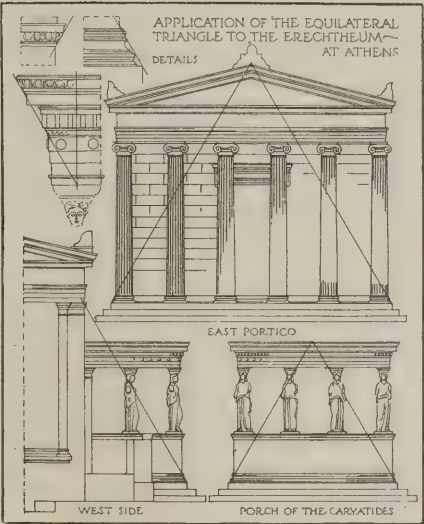


FIG. 2.

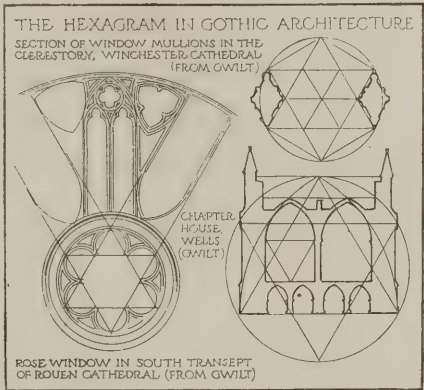


FIG. 5.

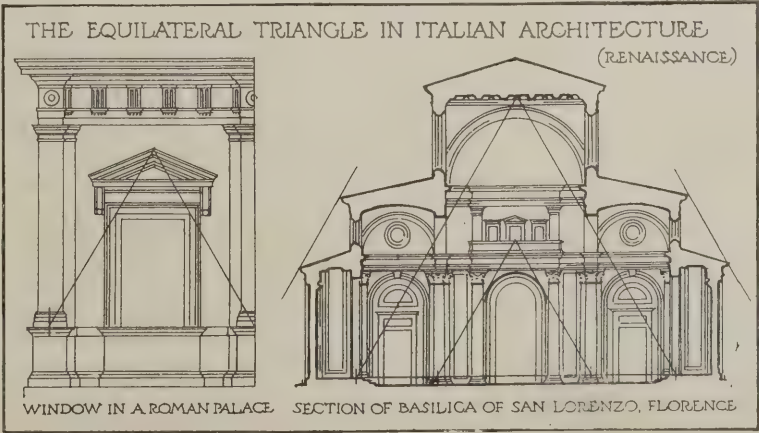
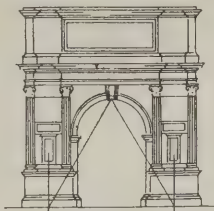
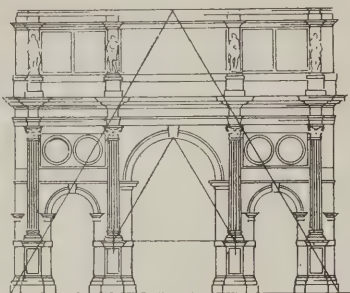


FIG. 4.

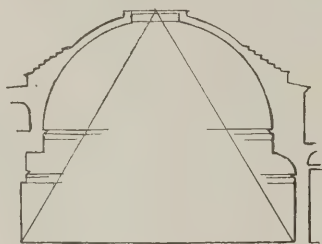
THE EQUILATERAL TRIANGLE IN ROMAN ARCHITECTURE



ARCH OF TITUS, ROME



ARCH OF CONSTANTINE, ROME



A SECTION OF THE PANTHEON, ROME

FIG. 3.

be stated as a general rule, that whenever three important points in any architectural composition approximately coincide with the three extremities of an equilateral triangle it makes for beauty of proportion.

An ancient and notable example occurs in the pyramids of Egypt, the sides of which, in their original condition, were, it is believed, equilateral triangles. It is a demonstrable fact that certain geometrical intersections give the proportions of the Greek orders. The perfect little Erechtheum of the Athenian acropolis would seem to have been proportioned by means of the equilateral triangle, both in general and in detail. The same figure, in conjunction with the square and the circle, was employed by the Romans in designing triumphal arches, basilicas, and baths. The *vescia piscis*, consisting of two arcs of a circle enclosing a double equilateral triangle, was often used during the Middle Ages in laying out the plans of churches and cathedrals. It is scarcely an exaggeration to say that an entire system of window tracery was based upon the circle and the equilateral triangle. That the latter figure was a determining factor in the proportioning of Gothic buildings is sufficiently proven (if such proof were needed) by the accompanying facsimile reproduction of an illustration from the Como edition of Vitruvius, published in Milan about 1521, which shows a vertical section of Milan cathedral, together with the system of equilateral triangles which determined its principal proportions. The architects of the Italian Renaissance, inheriting the Roman tradition in such matters, constantly recognized this essential principle of monumental design.

There is abundant evidence in support of the theory that the builders of antiquity, the masonic guilds of the Middle Ages, and the architects of the Italian Renaissance followed certain geometrical rules of proportion; but

even though this theory be denied or disproven—if after all these men obtained their results working unconsciously and at hazard—the fact of the existence of such rules remains unchanged, for, as has been well said, “the artist follows the rules without knowing them.” Laws of beauty there are, of which this rule of three is one, which are “dependent on the nature of human intelligence”—deep as the foundation of the world.

“Frozen Music.”

The famous saying that architecture is “frozen music” is a poetical statement of a philosophical truth. Music depends primarily upon the equal and regular division of time into beats, and of these beats into measures. Architecture implies the rhythmical division of space, and obedience to laws numerical and geometrical. A certain identity, therefore, exists between simple harmony in music and simple proportion in architecture. By translating the consonant tone intervals into number, “the universal solvent,” it is possible to give them a spatial, that is, an architectural expression. Such expression, considered as proportion only and divorced from ornament, will prove pleasing to the eye in the same way that its correlative is pleasing to the ear.

If a vibrating string yielding any given musical note be stopped in its centre, that is, divided by half, it will then give the octave of the original note. The numerical ratio which expresses the interval of the octave is, therefore, 1 : 2. If one-third instead of one-half of the string be stopped, and the remaining two-thirds struck, it will yield the musical fifth of the original note, which thus corresponds to the ratio 2 : 3. The length represented by 3 : 4 yields the fourth, 4 : 5 the major third, and 5 : 6 the minor third. These comprise the principal consonant intervals within the scope of one octave. The ratios of inverted intervals, so-called, are found by

THE NORMAN PORCH CANTERBURY—AN ARCHITECTURAL EXPRESSION OF A NOTE & HARMONICS

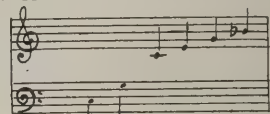


FIG. 7.

doubling the smaller number of the original interval as given above. 2 : 3, the fifth, gives 3 : 4, the fourth; 4 : 5, the major third, gives 5 : 8, the minor sixth; 5 : 6, the minor third, gives 6 : 10, or 3 : 5, the major sixth.

Of these various consonant intervals the octave, fifth and major third are the most important because the most perfect. It will be noted that all of the intervals above given are expressed by means of the numbers 1, 2, 3, 4, 5 and 6, except the minor sixth; and this, of all consonant intervals, is the most imperfect. The sub-minor seventh, whose ratio is 4 : 7 (Fig. 8), though included among the dissonances, forms according to Helmholtz

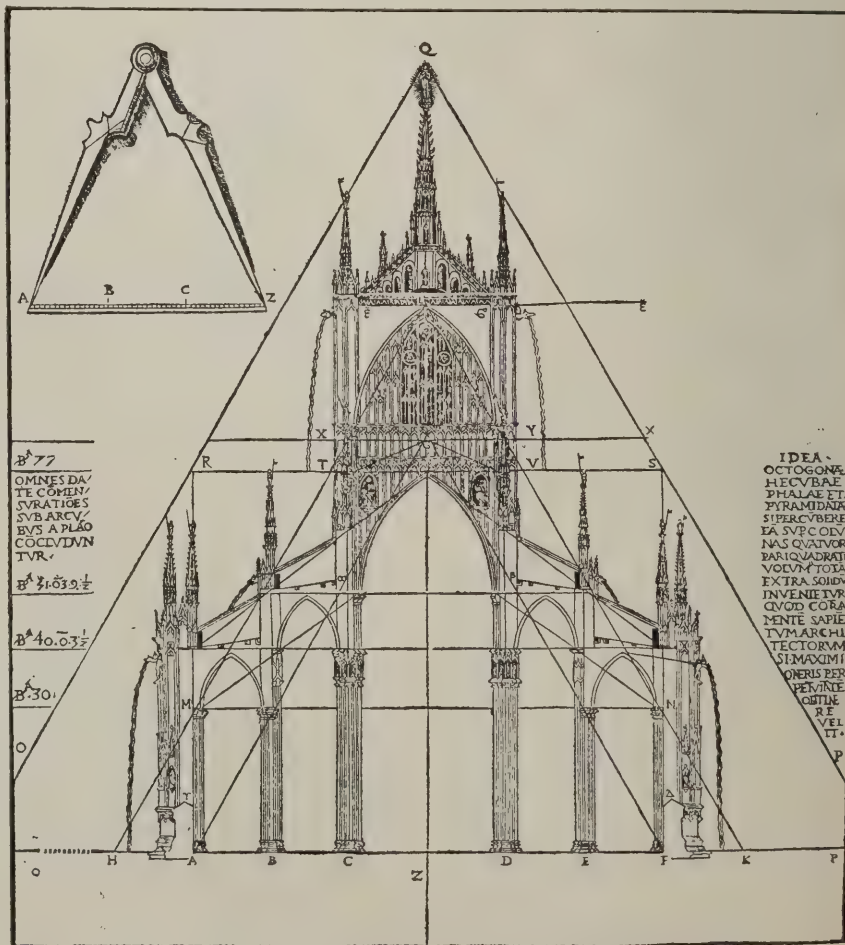
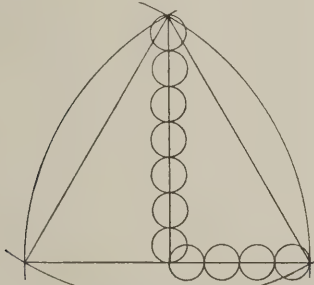


FIG. 6.—VERTICAL SECTION OF MILAN CATHEDRAL, FROM THE COSMO EDITION OF VITRUVIUS

a more perfect consonance with the tonic than the minor sixth.

A natural deduction from these facts is that relations of architectural length and breadth, height and width, to be "musical," should be capable of being expressed by ratios of quantitatively small numbers. Although, generally speaking, the simpler the ratio the more perfect the consonance, yet the intervals of the fifth and major third (2:3 and 4:5) are more pleasing than the octave (1:2), which is too obviously a repetition of the original note. From this it is reasonable to assume (and the assumption is borne out by experience) that proportions, the numerical ratios of which the eye resolves too readily, become at last wearisome. The relation should be felt rather than fathomed. As in music, where dissonances are introduced to give value to consonances which follow them, so in architecture simple ratios should be employed in connection with those more complex.



THE RELATION BETWEEN THE SUBMINOR SEVENTH (4:7) AND THE EQUILATERAL TRIANGLE~

FIG. 8.

Harmonics are those tones which sound with and reinforce any musical note when struck. The distinguishable harmonics of the tonic are given in Fig. 7. They yield the ratios 1:2, 2:3, 4:5 and 4:7. The note and its harmonics form a natural chord. Fig. 9 illustrates a simple application of musical ratios to architecture. The subminor seventh (4:7) used in this way in connection with the simpler intervals of the octave (1:2) and the fifth (2:3) is particularly pleasing, because it is neither too obvious nor too subtle. This interval is important from the fact that it expresses the angle of 60 degs., because the numbers 4 and 7 represent (very nearly) the ratio between one-half the base and the altitude of an equilateral triangle. According to Gwilt, the Gothic chapels at Windsor and Oxford are divided longitudinally by four, and transversely by seven equal parts.

A distinguishing characteristic of the series of ratios which represents the consonant intervals within the compass of an octave is that it advances by the addition of 1 to both terms, 1:2, 2:3, 3:4, 4:5 and 5:6. Such a series always approaches unity, just as, represented graphically by means of parallelograms, it tends toward a square. According to W. Watkiss Lloyd, the scale of ratios which determined all the important proportions of the Parthenon is of this order, advancing by consecutive differences of 5, as shown in Fig. 10. Mr. Lloyd goes on to say: "The oblong plan of the temple has exactly the proportion of breadth to length of 4:9-131'341 front, 228'141 on flank, (error, '012). The same proportion is repeated in the well-marked definition of breadth of top step—the hundred Attic feet—and the height from this step to the top of the horizontal cornice." (It will be noted that this, the most important ratio, is not the simplest.)

It would be a profitless task to attempt to formulate exact rules of architectural



FIG. 12.

proportion based upon the laws of musical harmony. The two arts are too different from each other for that; and moreover the last appeal must always be to the eye, and not to a mathematical formula, just as in music the last appeal is to the ear. Nothing is truer than that "the concept is unfruitful themselves to the artist as he proceeds, and in art." Laws there are, but they discover are for the most part incommunicable. No masterpiece was ever fashioned by means of predetermined formulæ of beauty, though from every masterpiece such formulæ may be deduced. And these are useful and valuable, not as a substitute for inspiration, but as a guide: not as wings, but as a tail. In the present instance, perhaps all that it is necessary for the architectural designer to consider is that important ratios of height and width should be composed of quantitatively small numbers; and that, if possible, they should obey some simple law of numerical progression. From this basic simplicity complexity will follow, but it will be an ordered and harmonious complexity, like that of a tree, or of a symphony. In the same way that a musical composition implies the division of time into equal and regular beats, so a work of architecture should have for its basis some unit of space. This unit should be nowhere too obvious, and may be varied within certain limits, just as musical time is retarded or accelerated. The underlying rhythm and symmetry will thus give value and distinction to such variation. Fig. 11, which shows a Doric and a Corinthian arcade laid out according to Vignola, illustrates how close a parallel exists between music and architecture in this matter of rhythm.

It is a demonstrable fact that musical sounds weave invisible patterns in the air. Architecture, in one of its aspects, is geometric pattern made tangible and enduring, i.e., "frozen music." In illustration of this, note the identity between the fragment of sculptured detail from the Erechtheum (Fig. 12) and the central portion of the front of Notre-Dame. The traceried arcades of the Venetian Ducal Palace remind one irresistibly of music. Every well-composed façade makes harmony in three dimensions: every good roof-line makes melody against the sky (Fig. 14).

(To be concluded.)

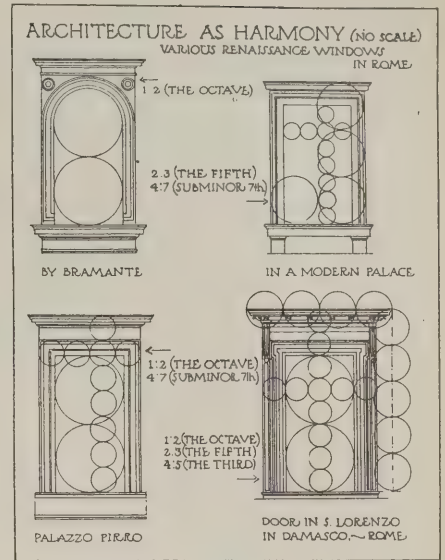


FIG. 9.

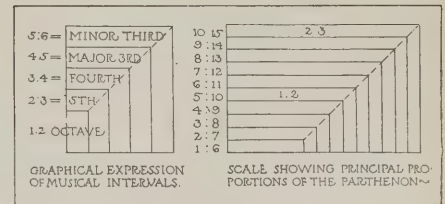


FIG. 10.

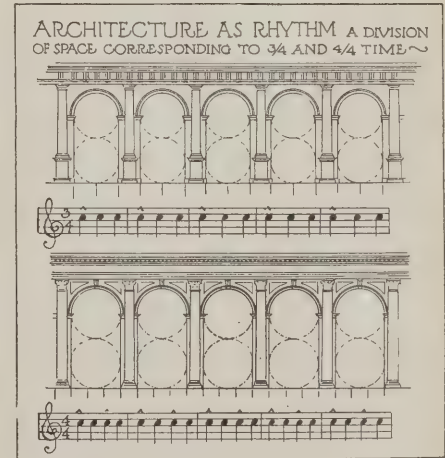


FIG. 11.

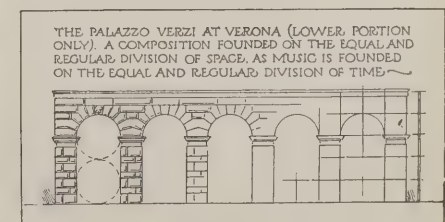


FIG. 13.



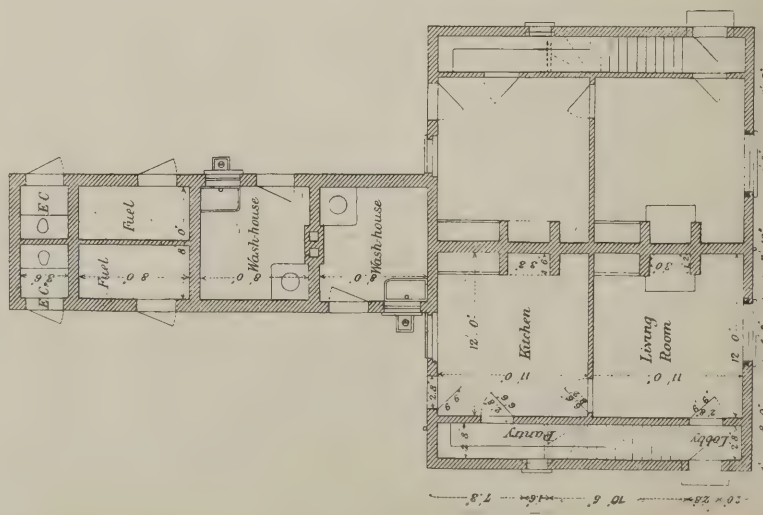
FIG. 14.



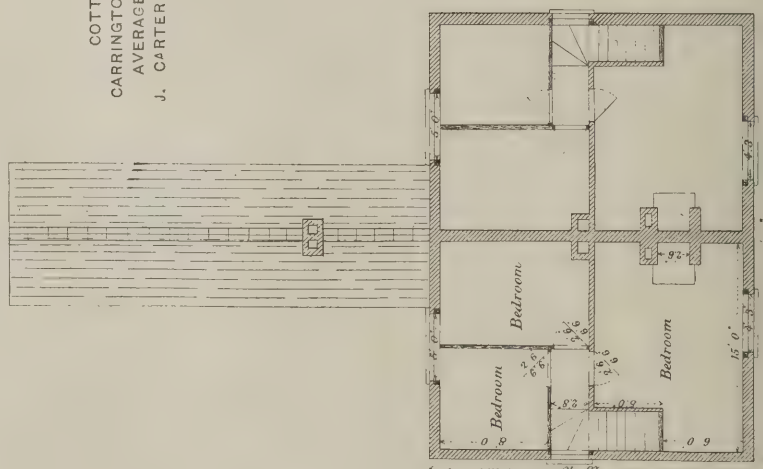
FRONT ELEVATION

BACK ELEVATION

SIDE ELEVATION

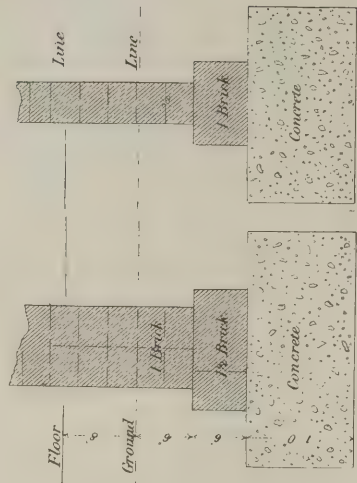


GROUND PLAN

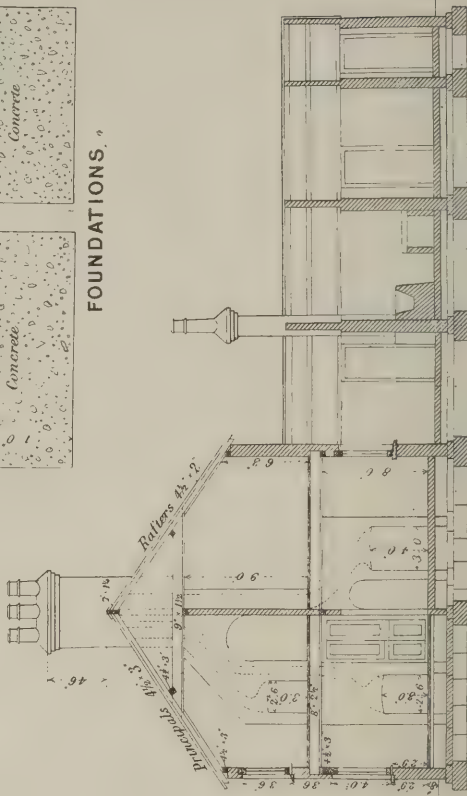


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FOUNDATIONS.



SECTION

EARL CARRINGTON'S COTTAGES.

ON p. 220 of our issue for last week we gave particulars of the cottages which Earl Carrington has erected on his estates in Buckinghamshire and Lincolnshire at an average cost of £153 10s., inclusive of builder's profit, but not architect's fees, because the design was prepared by his agents, Messrs. J. Carter Jonas & Sons, of Cambridge. The specification for these cottages, which may be seen at the agents' offices, does not call for detailed particulars, as it is of ordinary character, but we give the form of agreement below as being of considerable importance and use to architects and landowners:—

MEMORANDUM OF AGREEMENT made this _____ between J. CARTER JONAS & SONS, of Cambridge, as agents for and on behalf of the Rt. Hon. EARL CARRINGTON of the one part and _____ builder of the other part, hereinafter called the said "contractor"

WITNESSETH that the said _____ doth hereby agree to perform and execute the whole of the before-mentioned works agreeably to and in conformity with the following conditions and the above directions. To provide all kinds of materials, tools, scaffolding, tackle, centering

and everything requisite to complete the before-mentioned works to the fullest intent and meaning of the accompanying specification and drawings; to provide all labour and pay the current rate of wages of the district. That all and singular the said work shall be performed in a good sound and workmanlike manner with the best materials of their respective kinds well-seasoned and to the satisfaction of the said J. Carter Jonas & Sons, the surveyors, or such other surveyor for the time being the said Earl Carrington may appoint. And that in case the said contractor shall refuse or neglect to do and perform all and singular the said several works in such manner and with good and well-seasoned materials as hereinbefore is provided, or in case of his bankruptcy, death or insolvency, then it shall and may be lawful for the said J. Carter Jonas & Sons to employ and engage any other person or persons to perform, execute and complete the said several works which may be left by the said contractor unperformed or unfinished, and to find and provide materials for the same, and the costs and charges thereof shall be paid or allowed by the said contractor to the said Earl Carrington out of the moneys that may be then due or hereafter to become due to the said contractor for or on account of the performance of all or any part of the works hereby agreed to be done and executed. That in case the said Earl Carrington or his agents shall be dissatisfied with the manner in which the said works or any part thereof are proceeding, and shall deliver to the said contractor, or leave or cause to be left or sent to him by post at his usual place of abode or business a written notice stating the cause or reason of such dissatisfaction, then and in such case the said contractor shall and will forthwith reform and rectify such part or parts of the said works in such manner as shall thereby be particularized and required and conformably with the true intent and meaning of these presents. The said works to be commenced directly after the signing of the contract, and all the works contracted for, together with such as may be incidental thereto, are to be fully completed and possession of the premises given up to the said Earl Carrington upon or before the

next ensuing, and in default the said contractor is to forfeit the sum of _____ pounds per week for every week that they may remain unfinished after the date above-named for completion, such penalty to be stopped out of any moneys due to the said contractor. From the commencement of the said works to their completion, the care of the same and of whatever appertains thereto shall rest with the said contractor, solely, and no allowance shall be made for anything which may be lost, stolen, injured or destroyed. The works stipulated are to go on and be forwarded or retarded at such times and in such manner as the said J. Carter Jonas & Sons may direct, or as the state of the weather shall dictate, and in all cases of authorized delay a reasonable extension of time will be accorded in writing to the said contractor, who shall in case of any temporary stoppage from the weather or other cause duly cover up and protect the said works from damage, or make good the same, and in case it shall be deemed necessary or desirable by the said J. Carter Jonas & Sons to make any alterations, addition to, or omissions from the said works hereinbefore specified, the said J. Carter Jonas & Sons shall be at full liberty to do so, six days additional time beyond the time above-mentioned being allowed for doing every twenty-five pounds' worth of extra work, and such alterations shall not vitiate or vacate the contract hereby made or intended to be made, but whether arising by reasons of additions to or omissions from the aforesaid works shall be estimated and valued at the contract prices by the said J. Carter Jonas & Sons, whose decision as to their value shall be final and binding on all parties concerned, and who shall be the sole arbitrators in settling any dispute that shall or may arise in or about the said works. That in consideration of the said works to be done and executed in the erection of _____ pairs of cottages and outbuildings hereinbefore described, the said Earl Carrington doth hereby agree to pay or cause to be paid to the said contractor the sum of _____

in manner following, that is to say, seventy-five pounds per centum on the valuation and certificate of the said J. Carter Jonas & Sons as the works proceed, and the balance three months after the date of the certificate of the said J. Carter Jonas & Sons that the said works are complete, and upon the further certificate of the said J. Carter Jonas & Sons that the said works have properly stood. It being hereby further agreed that any damage arising to the said works, and any defects which may become apparent in the said works from the use of improper or unsound materials, bad workmanship or faulty or insufficient foundations within three months after the date of the said certificate of the said works being complete,

shall be rectified, remedied and made good to the fullest extent, and in every respect to the satisfaction of the said J. Carter Jonas & Sons, by the said contractor at his own costs and charges, and the said balance is to be further retained by the said Earl Carrington until all such damage or defects shall have been rectified, remedied and made good as aforesaid.

IN WITNESS WHEREOF the said parties have hereunto set their hands the day and year aforesaid.

In reference to Earl Carrington's letter to the "Times," given in our issue for last week, Mr. A. H. Clough writes: "As regards the cost of cottages, it will be observed that most of Lord Carrington's building operations are rather ancient history; only one pair of the specified cottages was built in the last ten years. But the cost of building has risen. The Board of Agriculture stated in evidence the other day that this increase has been very large in the last fifteen years, that it has been found necessary to allow loans of as much as £520 for a pair of cottages, and that £350 (the cost in Norfolk) is the lowest price now met with. However, it is probably true that in certain exceptional cases it would still be possible to build a very ugly pair of six-roomed houses for £300. But the experience of the Garden City Exhibition, where materials are exceptionally cheap and labour not particularly dear, shows that this would be difficult. The prize £150 cottage is extremely plain and economically planned. The rooms are good, but there are only five, not six. Yet cottages of this pattern (with the extras not reckoned in the £150), even at Garden City prices, would cost £340 a pair. At Guildford, according to the calculation of the council's surveyor, the cost of such a pair would be well over £400. It seems likely, therefore, that Lord Carrington's figures are not a safe guide for the ordinary country gentleman. Lord Carrington argues as follows:—I can build for £150 a six-roomed cottage 'in honest brick,' I am satisfied with a 2 per cent. return, and I look with contempt on wood and mud and plaster. But if the £150 turns out to be £200, if landlords would build for a 4 per cent. return, and not less, and if qualified architects and surveyors report that other materials are satisfactory, and that 'honest brick' may be porous and lets in water, we need not spend much time on Lord Carrington's rather obsolete statement of cost. To turn to the question of by-laws, Lord Carrington has clearly had very little experience of their working. He is no doubt unaware that in some districts a height of 9 ft. is required in all cottage bedrooms, and that surveyors frequently obstruct building by gratuitous bullying. Cases are reported this week of a surveyor sending back plans to ascertain the exact size of the hearths and the position of the movable dustbin. . . . I have had the pleasure of seeing Lord Carrington's plans. They would not, as they stand, satisfy the by-laws of any council under which I have built, not even those of the Garden City."

Garden City: Reply to a Lambeth Critic.

In reply to the criticism of the prize cottage at Letchworth made by Councillor Bristowe, of the Lambeth Borough Council (see p. 220 of our issue for last week), Mr. Thomas Adams, secretary of First Garden City, Ltd., says: "No plaster has 'left' the walls of this cottage, as alleged. Certain visitors prised the plaster off to see its thickness. . . . The object of the exhibition was to demonstrate the kind of cottage to be built in rural districts. London is not a rural district. . . . By the evidence of the judges . . . most of the cottages entered for the £150 prize were built for that sum. The builders of the first-prize cottage now offer to repeat it for £175, including profit and fees. . . . The land for the Cheap Cottages Exhibition has been let at from £7 to £15 an acre, the average being about £10, which represents a loss to the First Garden City: and this company had no connection whatever with the conference attended by Councillor Bristowe. The conference was called by the National Housing

Reform Council, and the Garden City Co. only lent the hall in which it was held, without charging any rent. The charge of 5s. was made by the Housing Council, and did not, I understand, pay expenses. . . ."

WAR OFFICE PLANNING.

A Severe Criticism.

THE "British Medical Journal" severely criticizes the plans for a home for the military nursing service which is to be erected in connection with the new military hospital at Millbank. Our contemporary says: "The plans were, we believe, drawn some time ago for the War Office by an engineer officer, and have, we understand, been finally adopted in the teeth of criticisms which, on investigation, we find to be well founded. The Army Nursing Home at Millbank is the first to be erected by the War Office, and will, no doubt, be taken as a model towards which other quarters for Army nurses, and other homes erected in connection with other military hospitals, may be expected to approach. It ought, therefore, to represent the last word on nursing homes, and, at any rate, not be inferior to homes erected in connection with voluntary civilian hospitals or poor-law union infirmaries. That it will be inferior there is clearly no doubt, unless public opinion can still restrain the War Office from carrying out the amateur plan which it has evolved. The War Office ought to call to its assistance the services of an architect of eminence experienced in the designing of hospitals and their appurtenances, and he should be given a free hand to bring the plans into harmony with modern requirements."

ARCHITECTURAL ASSOCIATION OF IRELAND.

President's Address.

THE annual general meeting of the Architectural Association of Ireland was held last week in Dublin, Mr. Harry Allberry, A.R.I.B.A., president, occupying the chair.

Mr. H. G. Leask, the secretary, read the eighth annual report, which stated that the past session had been one of the best since the Association was re-established in 1896. The present membership was 138.

The president in his inaugural address referred to the rumour that the buildings for the forthcoming Dublin Exhibition would emanate from the English side of the Channel. Architects at present in wealthy practice had perhaps no occasion to heed the signs of the times, but would it not be less selfish on their part to take thought for their successors and help them forward for battle in the years to come? Their ideal policy should not be that of the sealed compartment; it should be rather that of the open door, welcoming all competition, copying what was best and improving what might be bettered. The president then urged the importance of forming an Architectural College in Dublin on the lines of that at King's College, London. He also pointed to the necessity of giving lectures and holding examinations in connection with their profession, so that architects might possess proof of their qualifications.

Obituary.

Mr. Richard Price, a well-known builder and contractor in Shrewsbury, died suddenly last week, aged 69.

Mr. William Jenkyns, who for many years was closely identified with the late firm of Messrs. W. & J. Smith, city architects, Aberdeen, died last week in his ninety-first year. He supervised the building of Balmoral Castle.

THE VICTOR EMMANUEL MEMORIAL.

Death of the Architect.

IN our issue for September 27th we announced the death of Count Sacconi, the selected architect for the huge monument to Victor Emmanuel II. at Rome—a far more costly erection than the National Memorial to Queen Victoria. Count Sacconi's successor has not yet been appointed, and in the interregnum which prevails the Rome correspondent of the "Morning Post" has taken the opportunity of going all over the works, of which some sceptics say, as used to be said of Cologne Cathedral, that they will never be finished. It is more than twenty-five years since the Italian Parliament decided on the erection of this memorial, but it was not till 1884 that, after two competitions, the choice of an architect was made, and a design definitely adopted.

The Architectural Scheme.

Count Sacconi's plan, now in course of execution, comprises a great colonnade flanked by two square towers, in front of which is the huge pedestal which is to support the equestrian statue of Victor Emmanuel II.; the cast of his horse is now finished, and the horse itself will shortly be founded in Rome. Beneath this central figure it is proposed to have an allegorical representation of the cities of Italy doing homage to Rome. The monument will also contain large chambers, which will serve as a museum for the banners and other trophies of the *Risorgimento*. There will be two entrances—one in the front, up a flight of steps, from which a second flight will lead to the base of the great statue, and yet another to each side of the colonnade; while a second entrance at the back will pass through a tunnel beneath the steps of Ara Coeli and thus communicate with the Campidoglio. The monument will stand at a height of 235 ft. and will face straight down the Corso. The inside will be ornamented with rare old marbles found in the bed of the Tiber and elsewhere. Undoubtedly the whole when completed—and that cannot be before 1911 at the earliest—will be grandiose, like the now almost finished Palace of Justice at Rome. Whether it will be beautiful is a point on which opinions differ. "Very modern Italians assure me," says the correspondent, "that people will cross the Atlantic to see it; personally I think that Americans and Englishmen would prefer to see what it has displaced." These "displacements" include the picturesque sixteenth-century tower of Paul III., the Franciscan monastery belonging to the Church of Ara Coeli, fifty houses, and—worst of all—the picturesque Palazzetto, adjoining the Palazzo di Venezia. "Finally, it seems a crime against history to burrow under the steps of Ara Coeli, erected to commemorate the Black Death and the one considerable monument of the Avignon Papacy now left in Rome. Fortunately, the authorities have spared the interesting and massive blocks of the ancient Wall of the Kings, which were found during the excavations for the foundations of the monument. It is appropriate that the first kings of ancient Rome should have their monument by that of the first king of modern Italy."

The Colossal Expense.

Down to the middle of June, 1902, when no visible constructive work had been done, no less than £324,520 had been spent on prizes, models, funicular railways, foundations and compensations for houses destroyed, the last item alone amounting to £149,320, which might have been enormously reduced had the statue been erected on the Janiculum or on Monte Mario. The desire to have it on the Capitoline has thus not only led to unnecessary destruction but to unnecessary waste of money also. Down to the end of last year an additional £400,000 had been

spent, and there is more than five years' work still to be reckoned before the bill is complete. Thus the original sum of £320,000 voted by the Italian Parliament, even with the addition of another £57,509 subscribed by the public, has long ago been exhausted, and last year another £120,000 was granted. Continual strikes among the workmen—of whom there are 450 engaged on the monument itself and in the adjacent small stone-yards, as well as in the larger ones outside the Porta Maggiore—have caused extra delay and expense. Now arises the question of a successor to the architect—a man who will loyally carry out his work and not seek to earn fame for himself by altering the design.

SOCIETY OF ARCHITECTS.

Annual General Meeting: Report of Council.

THE annual general meeting of the Society of Architects was held on Thursday last at Staple Inn Buildings, Holborn, the chair being occupied by the retiring president, Mr. Walter W. Thomas, of Liverpool. The new president is Mr. A. E. Pridmore, of London.

The twenty-first annual report of the council was presented. This stated the Society to be in a very satisfactory condition. Since the last annual meeting there had been an unusually large number of applications for admission to membership, and 75 had been elected, while the register of students had been increased by 20. The total membership was now 703. During the past session a lady, Miss Annie Hall, of Cheltenham, was admitted to the register of students.

With regard to the bi-annual design competitions, the council pointed out that the proportion of students on the register who took advantage of them was very small; suggestions for popularizing them or for substituting some other scheme are invited.

In reference to the London Building Acts (Amendment) Bill, the council stated that a committee was still engaged on suggestions for amending the Acts upon the basis of the former Bill.

Extraoting Payment for Extraordinary Haulage.

The Institute of Builders had called the attention of the council to the practice of county and urban authorities in exacting payment of considerable sums of money for extraordinary traffic on roads over which materials were hauled for buildings, urging that as these charges added to the cost of the work and had eventually to be paid by the employer they should be arranged with the authorities beforehand. It was further pointed out that as there was no recognized system of charging, parties tendering did not compete on equal terms, as there was generally insufficient time before tendering to obtain definite information on this point.

Municipal Architects.

A memorandum had been issued by the council to every local authority in the Kingdom suggesting that where a qualified architect was not already permanently retained as an official of a local authority it was desirable that the assistance of a competent architect should be engaged for designing and carrying out the buildings, or where such permanent employment was not possible that the architectural work should be placed in the hands of a qualified local architect.

The Library and Reading-Room.

A considerable sum of money has been spent by the Society in the purchase of new books, and there is now the nucleus of a useful collection of modern works of a practical nature at the disposal of members, who are reminded that most of the books

may be borrowed, and that in the case of members residing at a distance the volumes can be sent by post. The reading-room has been found useful on several occasions by members (especially those from the country) as a rendezvous for clients. The room may be reserved by giving notice to the secretary.

Registration.

After referring to the Institute Bill, the council observed in regard to architects' registration that they proposed to continue their policy of watching and waiting until something definite had been arrived at by the senior body, and would resume their active propaganda when and as soon as the occasion required.

Examinations Abroad.

Consideration has been given to extending the scope of the Society's examinations by forming centres in various places abroad, and preliminary arrangements are already in hand for a centre at Bombay, while enquiries from South Africa are being dealt with.

Financial Position.

The financial position of the Society is sound. The council has added to the reserve fund, which now stands at £1,100, and could have done more in this direction, but that it believed to a reasonable extent the funds of the Society should, after providing for its proper working and the immediate interests of its members, be devoted to the objects for which the Society was founded, namely, the advancement of architectural art and practice generally, and the maintenance of the interests of the profession—hence its two contributions of £50 each to the *Gibbon v. Pease* appeal fund and to the building fund of the Architectural Association.

MR. GOODYEAR'S LECTURES ON ARCHITECTURAL REFINEMENTS.

MR. W. H. GOODYEAR, who has just come over from America, delivered last week the first of a series of lectures on architectural refinements at the Scottish National Portrait Gallery, Edinburgh, where the exhibition with which his name is associated is now being held. Mr. H. O. Tarbolton, president of the Edinburgh Architectural Association, presided. Mr. Goodyear commenced by a reference to the Cathedral of Pisa and its buildings, to which his attention had been given for the past twenty-five years. By the aid of lantern views he showed the variations which were to be found on the façade of the church on the horizontal and vertical building lines—variations which, he said, escaped general observation. He discussed the question whether these were due to subsidence or to other accidental causes, or whether they were intentional and intended to produce certain optical and pleasing illusions, possible by deviations from straight lines. He firmly held the view that the facts of the case of Pisa entirely precluded the theory of subsidence or accident, and argued that these "refinements" were the deliberate work of architects and builders. Such "refinements" took many forms, both inside and outside French and Italian cathedrals, but they were more numerous in the church of Pisa and St. Mark's, Venice, than in any others. In the elaborate arcaded façade of Pisa, for example, the first storey had a lean forward of 1 ft., the second a set-back of 6 ins., the third and fourth a lean forward of 1 ft. and the tenth of 1 ft. respectively, while those higher were perpendicular. These variations, many thought, were intended to give the façade an appearance of greater height than it really possessed. On the interior of churches various devices were used to correct the harsh perspective of straight lines or to make the interiors appear larger than they really were.

THE ARCHITECTURAL ASSOCIATION.

Mr. Andrew Oliver on the City Churches.

A MEETING of the Architectural Association was held on Friday evening at 18, Tufton Street, Westminster, the chair being occupied by Mr. Louis Ambler, vice-president.

The reinstatement of Mr. H. Chatfield Clarke was announced; also the following additional donations to the Building Fund:—

	£	s.	d.
H. Chatfield Clarke	-	-	10 10 0
H. Wigglesworth	-	-	5 5 0
F. Bisset	-	-	1 1 0
G. P. Bowie	-	-	1 1 0
R. J. Buck	-	-	1 1 0
G. Hubbard	-	-	1 1 0
C. Wontner Smith	-	-	1 1 0
J. Borrowman	-	-	0 10 6
S. Box	-	-	0 10 6
S. Chatfield Clarke	-	-	0 10 6
A. H. Fagg	-	-	0 10 6
I. T. Sifton	-	-	0 10 6
E. Howley Sim	-	-	0 10 6
A. H. Ryan-Tenison	-	-	0 10 6

Mr. Francis Hooper proposed and Mr. H. A. Satchell seconded the adoption of the council's report and balance sheet for the past session 1904-05, and the chairman proposed a vote of thanks to the Carpenters' Company for a donation of carpentry models to the Association's day and evening schools.

Mr. Andrew Oliver then read some "Notes on the Ecclesiastical Buildings of the City of London," illustrated by lantern views. The following is a comprehensive summary of the lecture:—

In dealing with the ecclesiastical buildings of the City of London it must not be forgotten that the edifices at present in existence form but a small portion of those that were originally constructed. But although the original edifices have so completely disappeared, yet we are able to reconstruct them, and thus set forth the glories of monastic London as it was in the palmy days of its ecclesiastical grandeur, the splendour of whose ruins can only be compared with those of Newark, Fountains and Glastonbury.

The Two Great Periods of Destruction.

The first great wave of destruction, not only in London but over the whole of England, took place in the reign of Henry VIII. and his successor, Edward VI., and it was at this period that the whole of the monastic edifices of the City were swept away. The second general destruction was the Great Fire of 1666, when not only did the few remnants of the monastic establishments utterly vanish, but nearly the whole of the churches of the City were overwhelmed.

The subject may be divided under the heads of (1) monasteries, (2) churches before 1666, (3) Wren's churches.

Monasteries.

The religious orders to which these belonged were the Benedictines, who had three nunneries—St. Helen's, Bishopsgate; Holywell, Shoreditch; and the Black Nuns, Clerkenwell. To the Carthusians belonged the Charter House; to the Cistercians the Abbey of Eastminster. To the Grey Friars or Franciscans belonged the monastery of the Grey Friars, Newgate; Christ's Hospital (where the Bluecoat School used to be) to the Blackfriars, or Dominicans; and, just outside the City, were the White Friars, or Carmelites. The Austin Canons possessed the greatest number of establishments—St. Bartholomew, Smithfield; St. Martin's-le-Grand, St. Mary of Bethlehem and St. Katherine of the Tower; the Priory of the Holy Trinity, Aldgate; and St. Mary Spital, Shoreditch; the Nuns of St. Clair, or the Minories—a minor order of the Franciscans, where the Minories now is. The Austin Friars had a house which was near Broad Street. The Preceptory of the Knights Templars was in Holborn, and later

at the Temple. The Knights of St. John, or the Hospitallers, were at Clerkenwell.

All that now remains of the foregoing is the chancel of St. Bartholomew, Smithfield, and part of the cloister of the church of St. Helen's, Bishopsgate, the nave of the church of the Austin Friars, part of the Charter House, the gateway, crypt and the nave of the Priory of St. John, Clerkenwell, and the Temple Church.

St. Martin's-le-Grand, 1056-1548.

This was the greatest of all the monastic edifices in the City, as well as being the most important. It was pulled down in 1548, and the General Post Office now stands upon the site.

Holy Trinity Priory.

This was founded in 1108. Norman was the first prior, and "he built the gate of Aldgate from the foundations." From a plan dated 1592 the dimensions of the church would appear to have been—length about 245ft., width 69ft., and across the transepts 120ft. The chapter-house site, and probably the walls, became St. James's Church, Duke's Place; Mitre Square occupies the site of the cloister; whilst Mitre Street passes right through the church and over the site of the high altar, and over the graves of the children of King Stephen.

Holywell Priory, Shoreditch.

This was founded in 1127, and the entrance was through a gateway which was standing in 1785. In the courtyard was the priory church, probably of late Norman date, with windows Early English and Decorated. The priory was suppressed in 1539. The whole site is now occupied by the Great Eastern Railway.

Blackfriars, 1176-1538.

This consisted of precincts, church and sanctuary, with four gates. The church, it would appear, was a very fine structure, about 66ft. in width by 230ft. in length, or rather larger than St. Saviour's, Southwark. There were two aisles, a chancel, a cloister 100ft. square, and a chapter-house to the west 44ft. by 22ft. New Inn now occupies the site of the first monastery.

The Greyfriars, or Franciscans (1225-1538)

occupied the site of the Bluecoat School, or Christ's Hospital. The monastery was founded in 1225 and the choir built in 1289. The nave and the other monastic buildings were erected later. The whole church was rebuilt and enlarged between 1306 and 1327. The plan shows some peculiarities. There were no projecting chapels, but the aisles were very wide, to allow chapels to be placed there. The nave was seven bays in length, with transepts and a central tower. The choir was also seven bays in length and along the centre was a row of tombs. The present church of Christ Church occupies part of the site of the choir.

Priory and Hospital of St. Mary of Bethlehem.

The Lunatic Hospital was removed here at the suppression, and afterwards to London Wall, and in 1814 to St. George's-in-the-Fields.

The Eastminster or St. Mary of Graces.

Of this once magnificent building no records are known as to what the buildings were.

Churches erected before 1666.

In the second division we find a complete sequence of architectural style from the Early Norman period to the middle of the seventeenth century.

The buildings may be classified under the periods as follows:—

The Norman Period.—St. John's Chapel in the Tower; St. Bartholomew, Smithfield; the crypt of Bow Church; the west end of All Hallow's, Barking; the Sacred Church of the Temple; and the crypt of St. John's, Clerkenwell.

The Early English Period.—St. Ethelburga, Bishopsgate.

The Decorated Period.—Great St. Helen's, the Austin Friars Church, Bishopsgate.

The Perpendicular Period.—St. Andrew Undershaft; St. Olave, Hart Street; and St. Giles, Cripplegate.

Transitional, Perpendicular and Renaissance.—St. Catherine Cree.

The Earliest Example

of ecclesiastical architecture in the City is the Chapel of St. John in the Tower. The exact date is somewhat uncertain. Gundolph, Bishop of Rochester, built the White Tower about 1178, so that this is probably the date of the chapel, or maybe a little later.

St. Bartholomew, Smithfield.

The Norman work on the chancel (what is now the nave) was executed by the founder Rahere and his successor between 1123 and 1174. The transepts, with the Early English work, were added during the ensuing fifty years, and possibly the nave, the site of which is at present occupied by the churchyard, and also the gateway. To the Perpendicular period belongs the range of clearstory windows and what is known as Prin. Bolton's pew and the tomb of the founder. The so-called pew is, in all probability, a watching loft, such as we find at St. Albans and other places. The clearstory windows in the apse are modern, and were the work of Sir Aston Webb. The Lady Chapel is of Early English date, and is entered from the ambulatory of the choir at the east end.

The Temple, 1185-1312.

The Knights Templars existed for about two hundred years, 1118-1312, and their first settlement was in Holborn, near Southampton Buildings. In 1180 they came to the present temple, which was consecrated five years later. The original church consisted of a round nave, the choir being added in 1240. The church consists of porch, a round nave and choir. The west doorway is Transitional Norman. The piers consist of Purbeck marble columns, with capitals, supporting pointed arches, over which is an arcade of intersecting semicircular arches. The clearstory windows above are round-headed; the choir, with nave and aisles, five bays in length. The vault is carried on marble shafts with richly-moulded capitals.

St. John's, Clerkenwell.

The earliest portion of the present chapel, now the crypt, was erected at the end of the eleventh century. West of this was situated a round church similar to the Temple Church, which was consecrated the same year, *i.e.*, 1185. The original chapel then became a crypt under the new church. The eastern end of the present crypt marks the extent of the Priory Church, and the crypt and present church represent the length of the choir.

Austin Friars.

The church, originally cruciform, containing a nave of bays, chancel, transept and central tower, was entirely destroyed, excepting the nave. The chancel extended as far as Broad Street, and the site is marked on the Ordnance map adjoining the chancel of the Church of St. Peter-le-Poer. It is now used by the Dutch Church.

The Charterhouse.

There is not much left of the old buildings, which were suppressed in 1537.

Great St. Helen's, Bishopsgate.

This was the church attached to the Benedictine nunnery. It consisted of a north aisle, or what is termed the nuns' aisle. This was entered on the north side from the cloisters, the doorway of which is still to be seen, together with a curious squint. This aisle was separated by a screen from the parochial nave, which has a transept and ten eastern chapels. The establishment, with

refectory, chapter-house and other buildings was practically complete until the end of the eighteenth century, when it was bought by the Leathersellers, and their present hall and St. Helen's Place occupy the site.

St. Ethelburga.

Before the suppression of the monasteries this church was attached to that of St. Helen. It consists of a nave, chancel and south aisle, with clearstory. The porch shows remains of tenth-century work.

All Hallow's, Barking.

was formerly attached to Barking Abbey. It consists of nave, chancel, aisles and clearstory. The piers at the west end are of Norman date, and the east end belongs to the Perpendicular period. Richard I. added a chapel on the north side.

St. Andrew Undershaft.

The church dates from the early part of the tenth century. The northern portion and part of the south aisle were built at the expense of Sir Stephen Jennings, Lord Mayor, 1508, and the church was completed in 1523 by William Fitzwilliam. It consists of a nave and aisles, clearstory, and a lofty tower. The most interesting monument is that of John Stow, the earliest writer upon London. The name Undershaft is due to the fact that the church stood originally under the Maypole or shaft.

St. Giles, Cripplegate.

The cripples had nothing to do with the name. The church is the successor of one erected about twenty-four years after the Conquest. It was partially rebuilt after a fire in 1545. Perhaps the most interesting person born in Cripplegate was John Milton. Foxe, Frobisher and Cromwell were buried here. In the churchyard is a part of one of the old bastions of the Roman wall. The naves, which formerly hid the north side, have been taken down and a statue of Milton has been erected on the site. The church, in the Perpendicular style, consists of nave, chancel and aisles. The steeple contains twelve bells.

Churches erected after 1666.

The series of buildings which followed the Great Fire, and which were the work of Sir Christopher Wren, were different in every respect from those which had been erected at a previous period. Up to that date the church architecture of the City resembled in the style, the detail and general arrangement that which was usually to be found in the architecture of the country, but with the advent of Wren a new style was created, and one belonging solely to the City of London. There is no city which shows such a great variety in its towers and spires, or in its church architecture, and all of this may be said to be due to the genius of one man. As may be supposed, there is considerable generalness in the design of some of the examples; this, however, may not be the fault of the architect, but through circumstances over which he may have had no control. Yet even if we allow this to be the case, one cannot fail to be struck with the beauty of many of the designs and of their adaptability to surroundings. They show not only great power in design, but a marvellous grasp of constructive detail. Hardly any one of them is constructed in a similar manner to the others.

St. Paul's.

The present cathedral of St. Paul, the grandest of Sir Christopher Wren's works, is the third building which has been erected. The first cathedral is said to have been founded in 597, and destroyed in 1087 by fire. In this latter year a new cathedral was built in the Norman style. In the year 1240 the choir was rebuilt and enlarged by being extended over the site of the Church of St. Faith. The tower and steeple were

completed in 1221, and the steeple was burnt in 1561, and never rebuilt. It is said that part of the stone intended for the rebuilding of St. Paul's steeple was given by Charles I. to the Duke of Buckingham to use in the building of Buckingham House. Some of the present watertower is built out of this stone originally intended for St. Paul's. The cathedral was partly repaired by Inigo Jones, who added the classic porch or narthex at the west end. Sir Christopher Wren was called in, and he proposed to take down the Gothic arches and substitute round ones of a neat Classic style and to erect a dome in place of the tower. These works were all stopped by the Great Fire, and various attempts made to patch the edifice, but, being futile, there came Wren's opportunity for the present building.

The Rebuilt Churches.

In the Harly MSS., 4941 (British Museum), there are three schemes for the rebuilding of the destroyed churches. The number first proposed was thirty-nine, but in the final arrangement this was altered to fifty churches, St. Paul's not being included, as it was considered at the time the matter was brought forward that the cathedral could be made suitable for public worship. In addition to these there was another batch which were rebuilt in the eighteenth century, about a dozen in all, by Nicholas Hawksmoor, who rebuilt St. Mary Woolnoth; George Dance, All Hallows-on-the-Wall; and churches by James Gold, Cockerell and others. None of these, with the exception of St. Mary Woolnoth, are of much interest architecturally or otherwise, so it will not be necessary to refer to them more fully.

In describing the churches which were erected by Wren it will be impossible to give a detailed account of the buildings. All that can be done will be to enumerate a few of the leading examples.

Types of Wren's Churches.

In the churches which Sir Christopher Wren erected we find the following types:—

The basilica—i.e., a parallelogram divided by arches—at St. Michael, Cornhill.

A nave, and north and south aisles, St. Mary-le-Bow.

At All Hallows the Great (now destroyed) a nave with only a north aisle.

St. Nicholas Cole Abbey shows a nave only, and at St. Stephen, Walbrook, we find the dome the leading feature of the interior.

With regard to the planning of the churches which were rebuilt, in many examples they follow upon the old lines, and even occupy the original sites of the old foundations. In some instances the old walls have been re-used, or re-faced, and many of the towers still retain the work of an earlier period.

Although Sir Christopher Wren was, to a great extent, tied by the old boundaries, yet he departed in many instances from the original ground plan and arrangement, and erected practically a new building.

Before this period most churches had followed one particular plan—i.e., a nave and aisles, separated by piers and columns.

A structural chancel was a rare feature in the London churches, most of which had been rebuilt in the fifteenth century without a chancel, the aisles being continued to the east end, and a screen being used to cut off the portion which was used as a chancel.

Towers and Spires.

The towers and spires of Sir Christopher Wren may be placed in four divisions:—(1) Towers; (2) towers and spires; (3) towers with lanthorns; (4) towers surmounted by a dome.

The first division, towers, contains one-half of the fifty examples which were erected originally. In many instances it is possible that the original walls of the structure were

left or repaired, and all that was done would be to add to the original structure. The additions chiefly consisted of a parapet wall, and sometimes we find stone vases, obelisks, or other architectural features at the angles, and in other cases round windows or openings inserted, and the walls refaced with stonework.

Of spires there are two kinds, namely, "stone spires" and "wooden structures covered with lead." Among the first was placed the destroyed spire of St. Antholin, which may be said to have been a true spire and constructed in the Gothic style; St. Bride, Fleet Street; St. Mary-le-Bow; St. Dunstan's-in-the-East (leaden spire); St. Martin's, Ludgate; St. Edmund, Lombard Street.

Towers with lanthorns, as St. Stephen, Walbrook; St. James, Garlickhithe; St. Michael, Paternoster.

Towers with cupolas in lead—St. Magnus, London Bridge; St. Peter, Cornhill; and St. Peter, Benetfink, destroyed.

A stone cupola was at St. Mary Magdalene, Old Fish Street, now destroyed.

Discussion.

Mr. J. D. Crace, in proposing a vote of thanks to Mr. Oliver, mentioned that on one occasion he happened to go into St. Bartholomew's, and thinking he saw traces of colouring in the Norman arches he scraped the surface and discovered a complete system of Norman colouring. Round churches had been mentioned. There were equally interesting examples at Northampton and Cambridge. With regard to Old St. Paul's, the spire, a wooden one, was the highest in Europe, and must have been a very conspicuous object. The origin of the name of Bow Church was connected with the vaulting beneath it, which was, in fact, the Court of Arches.

Mr. Hugh Stannus, Mr. J. Johnson and Mr. C. Lynam also spoke.

Mr. Banister Fletcher said that Wren had to deal with some extraordinary sites, but even in regard to planning alone his churches were worthy of study.

The chairman suggested that it would be of great service to them and to future students if members combined to measure and draw all the churches that had not been so done, and that these should be published in the Sketch Book.

It was announced that the next meeting of the Association would be held on November 17th, when Mr. J. A. Gotch would read a paper on "Old Manor Houses" at 7.30 p.m.

New Members.

The following have been elected members of the Architectural Association:—

R. G. Schute, A. D. Mallandaine, E. S. Hall, H. T. Barnard, D. L. Solomon, D. G. Hake, W. H. Crauford, F. J. McC. Maxwell, F. C. W. Dakers, W. H. Wilson, H. V. Love, L. G. H. McCredie, A. E. Harris, A. W. Hall, R. H. Cock, W. E. R. Randall, Junr., C. J. Bathurst, A. MacConnell, R. P. Oglesby, T. F. W. Rolfe, R. W. Fry, H. Dore, R. S. Prideaux, E. J. W. Whitehead, A. T. With, A. E. Vey, W. I. Keir, C. E. Fellowes Prynne, W. E. Trent, H. A. Ross, H. W. Brittan, E. J. Haslehurst, F. D. Danvers, R. Pierce, W. G. Gale, J. Newton, C. W. Denton, W. H. Huckvale, S. P. Schooling, T. M. Ellis, R. W. Cable, L. Keir-Hett, R. O. Bridger, D. G. Shrubsall, R. Knowles, P. J. Waldrum, J. G. de Parada, W. B. Jones, E. Newman, A. G. Blackford, W. Cook, Junr., H. M. Robertson, B. F. Matthews, T. H. Barrow, L. S. Wood, E. E. Morgan, O. R. Davis, W. H. Louw, T. M. Swales, A. R. C. Eaton, F. S. Jasper, G. T. Power, G. Sander-son, F. H. Knight, W. J. Jones, G. C. Wilson, F. G. Troup, C. D. Carus Wilson, H. Battiscombe, P. A. Tilden, A. L. Levy, V. Rienaeker.

Correspondence.

The Estimating Clerk.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I have read your leader, and think the estimating clerk should possess practical knowledge, but, as manager, in many instances, would not his high salary, in addition to that of the foreman of works, mean ruin to the employer? I think he would be better employed in ascertaining the market prices of materials and the cost of producing all kinds of work. I would like to point out to "R. E. M.," who has so ably supported your suggestions, that a low tender is sometimes the result of misconception.—Yours truly,

WOKING. FREDK. AYLOTT.

[Our correspondent looks at the matter from a reasonable standpoint as regards a small contractor's business. In such circumstances, we admit, the business is not large enough to support a highly efficient manager-estimator, and the contractor himself is the one who must undertake the work. Our remarks were directed to larger businesses where the contractor is so busy that the estimating clerk is a person of responsibility. Yet it must be admitted that many small contractors are neither by education nor training able to direct their business with efficiency, and to effect improvements; the estimating and the prime-cost clerks and manager-secretary-accountant are the usual persons that run the business, each more or less independently, while the contractor has not the ability to co-ordinate and supervise their work, but deals with the outdoor staff (the foremen and workmen). These latter are not particularly inventive, and as they do not watch prime costs and organization from the office, are not so competent to build up a business and strengthen weak points. As regards low tenders being sometimes submitted under misconceptions, this is no doubt so; mistakes in estimating due to carelessness and want of information are far too frequent; but low tenders are more often due to undercutting.—Ed. B. J.]

Damp Walls.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—With reference to an enquiry on p. 221 of your issue for last week, respecting the condensation of moisture upon paintings on the walls of a staircase, surely the answer is wrong. The walls and the air should be kept warm, not cold. Condensation takes place on a cold surface but not on a warm one. Varnish is not cold, but, being smooth and impermeable, offers less surface to the air than a rougher material; and being also a bad conductor of heat, when there is a rise in the temperature of air laden with moisture, that air becomes cooled by contact with the wall, and being no longer capable of holding so much water, the latter is deposited on the colder surface. Of course, plastering on battens may be applied outside, but the inference which would be drawn from the last words of the reply is that it is recommended inside, which would block out the paintings on the wall. Warming should be done by any other means than gas, as the combustion of gas evolves a considerable amount of water vapour. The surfaces under the lower floors should be looked to; the earth should be covered with smoothed concrete to prevent the damp air being drawn up into the house.—Yours truly,

HACKNEY.

A. H.

[The warmer air is, the more moisture will it absorb and sustain; of course when it comes in contact with a colder surface it is cooled and rids itself of the superabundant moisture, depositing it upon the surface. It is the difference in temperature which is responsible, and if the air in the staircase were kept practically at the same temperature as outside—which could only be done

by excluding the air from the house and giving plenty of ventilation in the staircase—the air, being at a low temperature, would not take up any further moisture, and being at the same temperature as the outside air (to which the walls would conform) would not give up any of the moisture that was carried by the outside air at that regular temperature. If, on the other hand, the air is warmed, it will absorb moisture only to deposit it on a surface colder than itself, and therefore unless the staircase walls were insulated so as to be warmed to approximately the same temperature as the inside air, the trouble would still continue. Surely the inference to be drawn from the suggested plastering on battens in order to insulate the walls was not that this should be done internally. Our correspondent at all events drew the correct inference, for he shows he understood our meaning. The statement as to the amount of water vapour from gas is correct, but in this case it did not appear that gas heating was the trouble. The last suggestion of our correspondent may offer some explanation of the dampness, but air can gain a sufficient amount of moisture from other sources to cause trouble.—Ed. B. J.]

A Word of Warning about Reinforced Concrete.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In view of the strong tendency displayed in many quarters to employ reinforced concrete for almost every purpose, a word of warning to some at least of the younger professional men will not perhaps be out of place.

With his strong conservative bent, the Englishman went on for years ignoring what was being done on the Continent and elsewhere with a combination of steel and concrete, till one day it seemed suddenly to dawn upon him that such a form of construction was perhaps feasible. Then he went to the other extreme. Visions of concrete, at perhaps 18s. a yard, very thin, with a few pieces of stout wire stuck through it, arose before him as a substitute for more legitimate construction, and these visions are still enjoyed by many—especially by laymen with would-be-scientific minds.

Now, as a matter of fact, the economy of using reinforced concrete as a building material is often a moot point. For instance, the gins. by gins. reinforced beam illustrated in your last issue would cost more than £1, while a rolled steel joist to do the same work could be obtained for less than 15s.; moreover, the coefficient of risk that reinforced concrete entails, owing to bad workmanship, is very high, whereas with a rolled steel joist the risk is practically nil. The concrete must form a homogeneous whole; it must be in perfect contact with the steel; and the cement must not swell in setting, or it will set up a tension in the steel before it is even loaded with the weight it has to carry. To obtain concrete of this homogeneous quality it is necessary to carefully grade the shingle in a way that an old-fashioned contractor would call "playing shops"; and then it has to be carefully measured in the proportions that are found to produce the best results with the particular grades of shingle and sand being used. Concrete made in the old-fashioned way by mixing two bags of cement to about a cartload of "the best I can get" kind of shingle hardly belongs to the same family as that necessary for reinforced work. The equally important necessity of perfect contact between concrete and steel is only obtained by "elbow grease," the concrete being carefully punned with small punners until the required adhesion can be fairly relied on; and it is evident that this will only be done well when there is a supervision almost approaching to that of the sentry over the convict.

If, then, after carefully considering the matter, it is found that reinforced concrete is cheaper or more efficient, by all means let it be used; but let it be really for one or other of these reasons that we adopt it, and not because it is the latest gilguy.—Yours truly,

A FELLOW OF THE
SURVEYORS' INSTITUTION.

Sand Lime Bricks.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—With reference to the enquiry and answer about patent bricks on p. 220 of your issue for last week, you are quite right in assuming that our system is the sand-lime process, but we do not understand your remarks about the bricks having the usual "defects of shortness and want of resistance to fire, crumbling under heat and water." As a matter of fact, these bricks when made are practically blocks of pure silicate of lime, and have been used with great satisfaction in Liverpool for lining copper furnaces, which have been thoroughly tested as regards to heat and cold. In one instance the bricks were frozen and thawed out twenty-eight times in succession without showing any flaw whatsoever. As a proof of their being of excellent quality and equal in all respects to the very best facing bricks, we have been favoured with an order for about a quarter of a million of these bricks for the new Liverpool Cotton Exchange, and a great many of them are now laid in the wall. Within the near vicinity your Glasgow querist "G." can see plenty of houses, some occupied and some in course of construction, built with these bricks; their appearance and weather-resisting qualities have been approved by all. In stating these facts we are only fair to ourselves, as we believe we are the only large commercial plant making headway in this industry, so far, in the United Kingdom.—Yours truly,

THE HYDRAULIC BRICK AND
STONE CO., LTD.

18, WATER STREET, LIVERPOOL.

Architects Boycotted by Builders.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Are you not just a little too severe in publishing in a journal which is ostensibly a builders' journal such criticism of the above as appeared in your issue for last week? I am not myself a builder, yet I have in past years moved amongst them very considerably. Builders require protection in the legitimate pursuit of their calling equally with the architect. Ruinous competition cannot be good even for a builder, yet it obtains to-day, and is largely brought about by the unfair tactics of those who employ them. How often does a contractor stand or fall by the tender he sends in? Not so often as the public imagine; and most architects know it. When tenders are opened there is a "reasoning together" on the part of proprietor and architect, and after a shuffling process the work is given out—but not necessarily to the contractor sending in the lowest tender. This innocent process has in time developed into abuse, and in turn has led the builders to protect themselves by combination. True they combine for many other purposes than the improvement of prices; but, after all, better prices is the pivot upon which all other reforms work. You refer to the Institute of Builders and the Master Builders' Association of Great Britain and Ireland, and you consider it their duty to excommunicate the Yarmouth branch of their Federation. To carry such an issue to its logical conclusion would be to exterminate themselves, for their fundamentals are the very essence of the conduct of the Yarmouth builders, who, in declining to tender for local work against outsiders, only in imagination are doing such an erroneous thing as the members of the Yarmouth Board

of Guardians allege against them. Were the Yarmouth builders to organize themselves under the dictates of the Master-Builders' Federation of Great Britain, they would have nothing to fear from their board of guardians.—Yours truly,
HULL. FEDERATION.

[For our correspondent to retort that there are architects as well as builders who have moral obtuseness in business is neither argument nor excuse. The title of this journal is intended to be taken in the widest sense, and not restricted to the support of contractors right or wrong. We never fear to uphold honest dealing, feeling assured that it is to the true interests of the building trade, as of any other industry. Our remarks were directed to a particular incident, and our correspondent is mistaken in trying to deal with it apart from the merits of this particular case. The secretary of the Yarmouth Master Builders' Protection Association has written to the local press replying to the statements at the guardians' meeting, and he admits that in the Association's rules there is the following clause: "That no member of this Association shall give a price in competition with any non-society builder in the district." The secretary thinks the architect was perfectly justified in refusing to give particulars of the work to an individual who was a non-society man, as he "knew the members of the society could not tender with him." He goes on to say, in reference to a member of the guardians, "Does he think that the man referred to would have sent in a lower tender than those sent in by the builders who tendered for the work?" He denies that there is a ring, as everyone is too hungry for work. This may be, but apparently the Association is trying to form a ring. A local correspondent alleges that on several occasions the Association has refused to admit to membership men who have superior claims to some in the august body. The attempts of trades-unions to prevent workmen who are not members from obtaining a living has been universally condemned by contractors. The Yarmouth builders are now trying similarly to interfere with the liberty of the subject.—ED. B. J.]

ESTIMATES.

AT last week's opening meeting of the session of the Ordained Surveyors Students' Society, Edinburgh (Mr. A. Cameron, president, in the chair), Mr. Forrest H. Lightbody, F.R.S.E., read a paper on "Estimates of Probable Costs," in the course of which he referred to the confusion which often existed in the public mind between estimates of probable cost and actual tenders. This, he thought, was in some degree attributable to the unfortunate use of the word "estimates" in the sense of "tenders." When actual tenders were wanted a detailed schedule of quantities of all the works necessary to complete the building was prepared by the surveyor. It might take weeks or even months to prepare these schedules. They were then sent out to the contractors, and formed the basis on which the actual tenders were calculated. The amounts of these tenders usually varied very much. In some cases the highest offer would be as much as 50 per cent. above the lowest. In estimating a probable cost the surveyor was not, of course, in possession of the detailed schedules of quantities, and had to resort either to the method of pricing the building at a rate per cube foot or other unit derived from his experience of other buildings, or to take out the quantities in a rough way and price them—to perform in one day, perhaps, what it might take six weeks to do accurately when he came afterwards to prepare the schedules of quantities. Yet he was expected to produce a result within smaller limits of variation than were usually found in the

case of tenders by contractors based upon accurate measurements. It was obvious that the greater their experience of the cost of other buildings the better equipped they would be to make an estimate of the probable cost of any class of building, and he strongly recommended students to record their experience in a careful and systematic way.

Builders' Notes.

For building Almshouses and a Blind Asylum at Painswick, Stroud, £100,000 has been bequeathed by the Gyde family.

Fair Wages Clause refused.—The Walsall Guardians refused last week to accede to a request from the Building Trades' Federation for a fair wages clause to be inserted in all building contracts.

A Tender for £45,000 for the erection of public baths and washhouses has been practically accepted by the Hammersmith Borough Council in order to provide work for the unemployed.

Messrs. Mellowes & Co., Ltd., of Corporation Street, Sheffield, have secured the order for glazing, on their "Eclipse" patent imperishable system, the roofs of the following buildings:—College goods sheds, North British Railways Co.; Wigan markets and car-sheds; Swadlincote car-sheds; extensions to works of Cammell, Laird & Co., Ltd., Sheffield; Ransome & Rapier, Ltd., Ipswich; Milner's safe works, Liverpool; National Gas Engine Co., Ltd., Ashton-under-Lyne; Hadfield's Steel Foundry Co., Ltd., Sheffield; Metropolitan Amalgamated Railway Carriage and Wagon Co., Ltd., Sabley; Buckley's Bleachery, Whitefield; &c.

Hollymoor Asylum, Birmingham: A saving of £15,874.—The Lunatic Asylums Committee of Visitors, Birmingham, report that on the building of the new asylum at Hollymoor there has been a saving of £15,874 on the builder's estimate, which was for £207,256, while the actual cost has been £191,382. The amount authorized for engineers' and electricians' work was £15,000 and the actual expenditure £14,739—a saving of £261. The preparation of the site was estimated to cost £9,250 and the actual cost was £9,085—a saving of £165. The railway sidings were estimated to cost £3,731 and they actually cost £3,462—a saving of £269. The amount authorized for architects and clerk of works was £12,500, the actual expenditure £12,244—a saving of £256. Only in "incidental expenses" was the estimate exceeded. The authorized amount for these was £1,513, whereas £2,842 was spent—an increase of £1,329.

An Important Amalgamation has been ratified recently in the purchase of the well-known business of the Darley Dale and District Stone Co., Ltd., of Darley Dale, near Matlock, by Messrs. J. Hodson & Son, Ltd., quarry-owners, general stone merchants and masonry contractors, of Nottingham. The works, adjoining the Darley Dale station on the Midland main line, are equipped with up-to-date stoneworking plant and include a large quantity of all descriptions of Derbyshire stone; also the well-known Hopton Wood stone and Yorkshire of several qualities. Orders of considerable magnitude can be executed promptly from these works, and when executed in conjunction with the thoroughly equipped plant at Nottingham can meet any demand. The stock is being rapidly cleared at very low prices, and all readers who are interested should communicate with Messrs. Hodson, who will forward particulars (and samples if necessary) on receipt of a postcard.

Law Cases.

Architect and Carnegie Dunfermline Trust.—The action has been settled in which Mr. T. H. Mawson, garden architect, of Windermere and London, sued the Dunfermline Carnegie Trustees for £3,101 for services said to have been rendered in connection with the carrying out of the Trust. The defendants said that Mr. Mawson exceeded his instructions by preparing a scheme which included the construction of tramways and boulevards and the displacement of a large proportion of the population of the town. They offered him £300 in full settlement of his services and outlay. Mr. Mawson has now received £527, and the action has been taken out of court.

Architects' Fees for Plans supplied but not carried out.—At the Conway County Court recently Mr. John Hughes, borough surveyor of Ruthin, sued Mr. F. Roberts, of Colwyn Bay, for the sum of five guineas, representing half the fee he would have charged for a set of designs for semi-detached houses, with which he supplied the defendant, if the defendant had built the houses from them. The plaintiff supplied the drawings when he was in practice as an architect at Colwyn Bay before taking up his duties as borough surveyor at Ruthin. After receiving the first set of drawings the defendant was stated to have changed his mind and to have asked for drawings for a single house, which Mr. Hughes supplied, but which were not acted upon, as the defendant ultimately employed another firm of architects.—The judge held that plaintiff was entitled to the amount claimed. Judgment accordingly, with costs.

A Building Contract.—A novel point was raised in a county-court case at Stockton last week. A Middlesbrough builder and contractor named Price sued a Stockton joiner named Mawood for £65 12s., the balance of a contract to build eight houses. The contract was a verbal one, but subsequently Mawood asked Price to put it into writing. Price could neither read nor write, and a man named Earnshaw was engaged to put the contract into writing. Earnshaw made a mistake, and Price did not find out the error until he went for the balance of the contract money. For the defence it was contended that Price could not succeed, but must take action for the rectification of the contract, and then it would have to be shown that the mistake was a mutual one. Earnshaw said that when he made out the contract he confused two classes of houses, and quoted £83 instead of £93. Judgment was given for Mawood, his Honour remarking that the action by Price was not that of a man who had made a mistake in a contract.

What Notice a Clerk of Works should be given.—At the City of London Court recently, before his Honour Judge Lumley Smith, K.C., Mr. W. H. Hudson, clerk of works, Kilburn, claimed £48 12s. 8d. from the governors of Leys School, Cambridge, for three months' wages in lieu of notice. Mr. S. P. J. Merlin appeared for the plaintiff and Mr. Chester Jones for the defendants. Plaintiff said he was engaged by the defendants as clerk of works, at 3½ guineas a week, to look after the erection of their new chapel at Cambridge. He was told that the work would last for a year, and accordingly he took his family down to Cambridge. After he had worked for defendants for five or six weeks he was dismissed on a week's notice. Now he demanded three months' salary, as that was the usual custom of the trade. Defendants said that a week's notice was quite sufficient, and they called the secretary of the Clerks of Works' Association in support of their case, who admitted that three months was given on large jobs. The judge said the plaintiff was entitled to a month's notice, and found for the plaintiff for eleven guineas, with costs.

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WALTER



TAPPER, ARCHITECT. (*Royal Academy Exhibition, 1905.*)

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SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

President's Address.

MR. E. HOLMES delivered his presidential address to the Sheffield Society of Architects and Surveyors on Thursday last. Speaking of housing in Sheffield, he said the question was intimately connected with the proposed new by-laws, and the council of the Society would closely bear that in mind when they were approached by the City Council upon the subject, as they would be in due course. He advised younger members especially to take up seriously the matter of cheap sanitary cottages. Referring to the educational facilities provided by the Society, he said that these had not been taken advantage of by the younger members to anything like the extent they should have been. During the session 1903 and 1904, out of three competitions only two were awarded, the essays in the other not being considered of sufficient worth to merit recognition; whilst during the session 1904 and 1905, out of four competitions, the prize was only awarded in one case; in one of the others the work submitted was not worthy of an award; and in the remaining two there was no response. With regard to registration he observed that it was not the wish of anyone that a mere technicality should qualify or disqualify anyone from practising as an architect, but the members felt that as so many questions of sanitation and healthy living were involved in the knowledge of architecture, some system of registration involving qualification by examination was absolutely necessary.

Mr. Winder in his address last year alluded to the necessity for the consolidation of local and other Acts of Parliament relating to new streets and buildings: and Mr. Holmes said he had always been strongly of this opinion.

They were all glad that the law as to right of light had been to some extent defined by a recent decision, but it was still in a most unsatisfactory position, and property owners who wished to re-erect buildings in a large town were liable to be subject to actions which were, many of them, neither more nor less than blackmail. The Society should consider in what way the law could be amended and defined, and at the same time they should resolve that in the course of their practice they would not support a client in any action merely for the sake of squeezing money out of an adjoining owner where no real nuisance was caused.

OUR PLATES.

THE Church of St. Erkenwald, at South-end-on-Sea, comprises a nave of four bays, with a north aisle and a chancel of two bays. Only the latter and a portion of the nave is being built at present. The walls are of stock bricks plastered internally with a view to their being decoratively painted at some future time. The architect is Mr. Walter J. Tapper, of London. The portion of the church so far completed was opened for service about a month ago.

Competitions.

New Drill Hall, Bury.—This competition has been decided as follows:—First premium, Mr. A. Hopkinson, Bury; second, Mr. G. H. Willoughby, F.R.I.B.A., Manchester. The estimated outlay will be about £10,000.

Secondary School for Girls.—A scheme has been approved for the erection of a secondary school for 500 girls on the site immediately behind the municipal secondary school in Wintworth Street, Manchester, and a competition among Manchester architects is to be held.

Keystones.

A new Workhouse Infirmary at Exeter was opened last week. It provides for 156 beds, and has cost £16,000. Mr. R. M. Challice is the architect.

The Church of St. Columba, Drumcondra, was dedicated last week by the Archbishop of Dublin. Mr. Ashlin and Mr. Coleman were the architects.

A Valuable Architectural Library, gathered together by the late Mr. George Henderson, architect, of Edinburgh, is to be sold by auction within the next week.

Higher than the Eiffel Tower. — The Weber Tower which is proposed to be built in New York will be 1,250ft. high. It is to be of steel and concrete, with balconies at various heights. Eight lifts will be installed.

Tramways over Blackfriars Bridge. — At last week's meeting the Court of Common Council decided to apply to Parliament for powers to widen Blackfriars Bridge in order to allow tramways to run over it, or, as an alternative scheme, to build a new bridge.

Society of Architects: New President and Council. — The officers and members of council of the Society of Architects for the year 1905-06 are as follows:—*President*, Mr. A. E. Pridmore (London); *vice-presidents*, Messrs. G. A. T. Middleton (London) and R. F. Vallance (Mansfield); *council*, Messrs. E. C. Beaumont (London), G. E. Bond (Rochester), B. D. Cancellor (Winchester), J. W. Dyson (Newcastle-on-Tyne), E. M. Leest (Devonport), C. H. Mead (London), D. Morgan (Cardiff), T. G. Price (Birmingham), T. R. Richards (London), A. Scott (Dublin), W. Scott-Deakin (Shrewsbury) and T. F. Tickner (Coventry).

At Childwall Parish Church a new north aisle, transept, side chapel and chancel aisle are being added at an estimated cost of £5,000. The architects are Messrs. J. Francis & S. W. Doyle, and the builders Messrs. Roberts & Robinson, Ltd., both of Liverpool. Prior to the laying of the foundation-stone last week a bottle was inserted containing plans showing the church at various stages of its history (one being that of the original church as it existed in 1767); also a set of plans showing the present alterations. The new work has been entered upon in consequence of the arches on the north side of the nave, erected in 1832, gradually showing signs of displacement and becoming unsafe.

Proposed new Streets through Bloomsbury. — A committee of the Holborn Borough Council had before them last week a scheme for constructing new streets in Bloomsbury, proposed by the Duke of Bedford. From Montague Place to Torrington Square it is proposed to form a street 130ft. wide (30ft. wider than Kingsway), and to form another new street (40ft. wide) parallel with Gower Street, between that thoroughfare and Torrington Square, extending from Montague Place to Euston Road. The scheme makes provision for the extension of the British Museum northwards, giving it a frontage in Montague Place.

An Exhibition of Decorative Architecture in Russia will be held during April and May next year in the Michael Riding School at St. Petersburg. The exhibition is being arranged by the Russian Society of Civil Engineers, and both Russian and foreign exhibits will be received. The exhibition is intended to furnish a complete and systematic record of the present condition of building in all its branches, and the exhibits will be distributed in seven sections, namely:—(1) Building materials and their application; (2) various trades and industries allied to building; (3) sanitary architecture; (4) fire-precautionary arrangements, (5) electro-

technology in its application to building; (6) artistic decoration of dwellings and buildings within and without, and (7) special literature and text-books. It will probably be in the interests of many British firms to exhibit building materials, &c., as there is a considerable field in Russia for commerce in this direction. Full particulars may be obtained from the official representative of the exhibition in Great Britain, Dr. Paul Dvorkovitz, 45, St. Mary Axe, E.C.

NEW LONDON BUILDINGS.

AT yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:—

A projecting pilaster between Nos. 58 and 59, Upper Street, Islington, on the application of F. Sage & Co., Ltd., on behalf of Jones & Sons. (*Consent.*)

Detached houses on the east side of Mycenæ Road, Westcombe Park Road, Greenwich, on the application of Crickmay & Heath on behalf of W. C. Johnson. (*Consent.*)

A projecting clock at the Royal Victoria Hall, Waterloo Road, Lambeth, on the application of J. Walker, Ltd. (*Consent.*)

An iron and glass conservatory at the first-floor level in front of "Keith House," Bayswater Road, Paddington, on the application of E. C. Macpherson on behalf of Sir Clifton Robinson. (*Consent.*)

A projecting balcony at No. 27, Maddox Street, St. George, Hanover Square, on the application of E. K. Purchase. (*Consent.*)

Porches to ten houses on the west side of Luttrell Street, Putney, on application of E. H. Wallis & Co. (*Consent.*)

An extension of the periods within which the erection of an addition, with a projecting portion, to the Westminster Technical Institute, Vincent Square, Westminster, was required to be commenced and completed on the application of P. N. Ginhams. (*Consent.*)

Consent to the erection of buildings on a site abutting upon the south side of Clapham Park Road and the east side of Park Hill, Clapham, on the application of the Council of the Metropolitan Borough of Wandsworth. (*Consent.*)

A one-storey office building on the south-west side of Holloway Road, Islington, on the application of V. F. V. de Brauwere on behalf of H. E. Butcher. (*Refusal.*)

Buildings on a site abutting upon the east side of Urswick Road, south side of Lesbia Road and north side of College Avenue, Hackney, on the application of J. G. Tewson on behalf of D. Burnett. (*Refusal.*)

One-storey shops on part of the forecourts of Nos. 29 and 31, Beacon Road, Hither Green, Lewisham, on the application of H. Kent. (*Refusal.*)

A building on the site of the tramways depot on the north-eastern side of Warters Road, next Camden Road, Islington, with external walls at less than the prescribed distance from the centre of the roadway of Warters Road, on the application of E. J. Edwards on behalf of the Highways Committee of the Council. (*Consent.*)

Buildings upon a site abutting upon the southern side of Fulham Road, western side of Fulham Park Road and eastern side of Landridge Road, on the application of Withers & Meredith on behalf of Spencer, Santo & Co. (*Refusal.*)

A cycle and tool shed at No. 38, Doneraile Street, Fulham, to abut upon Woodlawn Road, on the application of C. Botterill on behalf of G. Williams. (*Refusal.*)

An iron shed on a site abutting upon the north side of Lavington Street and south side of Farnham Place, Southwark, with the forecourt boundary at less than the prescribed distance from the centre of the roadway of Farnham Place, on the application of F. Wheeler & Son on behalf of Measures Brothers, Ltd. (*Consent.*)

A deviation from the plans approved on May 10th, 1904, for the rebuilding of Nos. 85 and 86, Jermyn Street, and Nos. 10 and 11, Ormond Yard, St. James, so far as relates to the erection of small buildings in the yard at the rear of the Waterloo Hotel, on the application of G. D. Martin. (*Consent.*)

To waive the provision of the air-duct shown on the first-floor plan and back elevation, dated September 27th, 1905 (Registered No. S.A. 32187), as to be provided at the first-floor level of the premises. (*Refusal.*)

A modification of the provisions of that section with regard to open spaces about buildings so far as relates to the proposed erection of St. Stephen's Vicarage, St. Stephen's Square, Southwark, on the application of J. W. Rhodes on behalf of the Rev. W. Dodge. (*Refusal.*)

The retention of a water-closet building and the alteration and reconstruction into a dwelling-house of a stable building at the rear of the "Duke of Clarence" public-house, No. 181, Camberwell Road, Camberwell, on the application of F. J. Eedle & Meyers on behalf of A. E. Garard. (*Consent.*)

Alterations at No. 7, Noel Street, Soho, on the application of G. C. Lambert. (*Refusal.*)

Blocks of intended dwelling-houses to be inhabited by persons of the working class on a site on the southern side of Adelina Grove, Mile End, on the application of W. E. H. Crawley, of No. 23, Victoria Park Road, London, N.E., on behalf of the Mercers' Company. (*Consent.*)

Means of escape in case of fire on the seventh (top) storey of Nos. 1 and 1A, Cockspur Street, Strand, on the application of H. Tanner, junr. (*Consent.*)

THE HEATING OF SCHOOLS IN AMERICA.

English Engineer's Inspection and Conclusions.

AT a meeting of the Institution of Heating and Ventilating Engineers (Incorporated) held last week at the Institution of Mechanical Engineers, Westminster, Mr. J. D. Sutcliffe read a paper on "The Progress of American Schools in regard to Health Laws, from an English Engineer's Point of View"—this being the result of a seven weeks' tour made by the author for the purpose of examining the schools of the eastern and central states of America so as to see what progress had been made since the author's previous visit fourteen years ago. The progress was most marked. In 1891 the author found that the majority of the schools in the eastern states were warmed by hot-air furnaces fixed in the basement on what was known as the "Smead System." This system has now been almost entirely superseded by steam and hot water heating combined with fan ventilation, though great credit is due to Mr. Smead for the educational and pioneer work done by him: his system, however, was never considered suitable for the English climate, as the air was passed over the outside of a furnace which warmed it to the required temperature, and English engineers considered such air too dry and too liable to have the nature burned out of it. America has evidently come to the same conclusion.

The State of Massachusetts was the first to draft rules and regulations for the building of schools, and even in 1891 there were most stringent regulations for the heating, ventilation and sanitation of such buildings. These regulations stipulated that all rooms and corridors were to be heated to 70 degs. Fahr. in any weather, and that the supply of air was to be at least 30 cub. ft. per minute per scholar.

With regard to the temperature to be maintained, Mr. Sutcliffe observed that this was very stringent, and in the opinion of most English engineers far too high. "It must not be forgotten, however, that the percentage of humidity in the air is small compared with this country, and most people find that 70 degs. is not more comfortable in America than 60 degs. in England."

A Typical Modern Example.

The following description of one of the most recent schools in Chicago shows the amount of care taken to provide fresh air and comfortable working conditions for the children. The school selected is a three-storey building, 174ft. by 124ft. on plan, with twenty-seven rooms in addition to those in the basement. The three floors are practically identical; there is a longitudinal central corridor with the rooms on either side and a stairway at each end. The classrooms, eight per floor, are practically all of the same size, 27ft. by 32ft., and each has a spacious wardrobe through which the heating and ventilating flues rise. Air is distributed throughout the building on the plenum system. It is received by a double outlet fan in the centre of the basement, and discharged in opposite directions through both tempering and heating coils placed immediately beyond. The individual room supplies are carried from the warm-air plenum chamber to the various groups of flues. The fan is run at a speed of 150 revolutions per minute (belt-driven from a 9in. by 14in. steam engine) and has a capacity under an assumed air-pressure of $\frac{3}{4}$ oz. of about 25,000 cub. ft. from each outlet per minute. Every outlet, however, has a plate to enable any desired quantity of the delivery, up to 50 per cent., to be cut off. The air is carried from the plenum chamber through the small blast ducts to vertical flues, and thence to the room inlets, each room supply being independent. The air is delivered

about 6ft. above the floor level, but the area of the opening is such that a considerable reduction of the velocity of the incoming air is effected. Among the requirements of the apparatus it is specified that the supply shall amount to 1,800 cub. ft. of air per hour per scholar, assuming an average occupancy of fifty-four scholars per room. The escape of air from the rooms is in general through side registers at the floor line in the wardrobes, this method providing for warming these rooms as well. The exhaust system is designed to provide for the discharge of about 75 per cent. of the inflow from the fan into the building, the rest of the air escaping through the numerous inevitable points of egress possessed by every building besides the open doors. There are two boilers of the horizontal tubular type, 5ft. in diameter and 18ft. long, containing forty-eight 4in. tubes, and a pressure of 45 lbs. is carried. The exact cost of this building could not be ascertained, but a similar new school which is just being completed is expected to cost £29,000, of which £2,400 is allowed for the warming and ventilating plant.

Comparison of Steam-heated and Furnace-heated Schools.

Mr. T. G. Waters, who is the appointed expert in heating, ventilation and sanitation to the Chicago Board of Guardians, gave Mr. Sutcliffe some figures relating to two eight-roomed schools, each accommodating 320 scholars, which were erected in 1894. One of these had steam-heating apparatus and was mechanically ventilated by fans, while the other was heated by warm air from furnaces and ventilated by natural means only. The warming and ventilating plant in the first school originally cost £1,000 and in the furnace-heated school £640. The total cost of the bituminous coal used in the steam plant (at 10s. per ton) amounted to £90 per year, whilst anthracite had to be burned in the furnace plant, costing 26s. per ton, and the average cost of fuel was £200 per year. The steam-heated building was also less costly to maintain, the repairs to the plant from 1894 to date amounting to only £17, whilst £90 had been spent in the same time on the furnace heaters.

A Criticism.

Although one must admire the thoroughness with which the whole subject of heating, ventilation and sanitation has been studied in America, Mr. Sutcliffe said he could not altogether agree with the methods most in favour. As an example, all the heating surface was placed at one point in the basement. "Now they frequently get temperatures of 40 degs. to 45 degs. Fahr. below freezing, and this means that the hot air has to be delivered into the rooms at a temperature of from 150 degs. Fahr. to 170 degs. Fahr. in order to maintain an average temperature of 70 degs. throughout. It cannot be considered good practice, and doubtless in time the methods will be modified to avoid such high initial temperatures."

New York Schools.

Turning next to New York, similar stringent rules are in force. The city has its own board of education, and this board has its own architect: it also appoints a chief engineer, who is a trained man and designs all the heating, ventilating, sanitary and fire-prevention appliances, and sees to their proper application.

Mr. Sutcliffe said he had visited the new High School of Commerce, and in his opinion there was certainly no school in England, excepting perhaps the Manchester School of Technology, that could compare with it. The steam supply is furnished by four boilers, 18ft. long and 4½ft. diameter, and the conveyance of coal to these boilers and the removal of ashes from them is by an overhead trolley track which saves a great amount of floor space. It was specified that the whole building was to be kept at a

temperature of 70 degs. Fahr. in any weather, and the fans are large enough to supply fresh air at the rate of 1,800 cub. ft. per hour for every scholar in the building. This air is only delivered at a temperature of 68 degs., the real warming being done by steam-heated radiators fixed in each room. The radiators are all controlled automatically, so that if the temperature in any part gets above 70 degs. the nearest radiators are partially closed off, while if it sinks below 70 degs. the steam supply is increased. "This is much sounder in principle and design than the Chicago method of concentrating all the heating surface at one point, as the air is forced into the rooms at a normal temperature."

Boston Schools.

In Boston Mr. Sutcliffe had a long and interesting talk with Professor Woodbridge, who is recognized as an authority on the warming and ventilating of American school buildings. He recently designed a very effective plant for the Senate House at Washington, and is a great advocate of the plenum system of combined warming and ventilation. Speaking of the difficulties of keeping the ducts clean and free from dust, Professor Woodbridge said that he had made numerous tests of this dust and had always found it perfectly harmless. His theory was that with the large volumes of air passed through the ducts the oxygen so thoroughly purified the dust and dirt that no harm could possibly come from it.

Mr. Sutcliffe spent a day in examining the new Harvard Medical Schools at Boston, which are fast approaching completion. There are five huge schools in separate blocks and a large power-house occupying another block. Each block is three storeys high, and some idea of the equipment may be gathered from the fact that ten fans, each 15ft. in diameter, are used for supplying fresh air to the various rooms, and thirty-two fans of 7ft. diameter for exhausting the foul air. The heating of the building is on what is known as the "forced hot-water system," that is to say, water is heated by exhaust or live steam, and then forced through the pipes and radiators, completing the circuit back again to the heaters. The circulation in the pipe is so rapid that in sending the water round a circuit of 2½ miles it only drops about 7 degs. Fahr. in temperature. Some idea of the enormous size of these schools may be gathered from the fact that 104,000 sq. ft. of heating surface is used for warming the buildings, about half of the surface being placed close to the fans and the other half distributed in the form of radiators in the different rooms and corridors. The filtering of the air has received considerable attention, and each fan has its own air-supply and its own filter. The filter for each fan consists of 260 bags or sacks 6ft. long and 10ins. diameter. Fresh air enters at the front of the bag, and must, of course, pass through the fine canvas before it can reach the fan. The bags are easily taken down and cleaned or washed and others put in place whilst this is being done.

New Legislation.

The State of New York (as distinguished from the City of New York) last year passed an Act to "Amend the Consolidated School Law relative to the proper Sanitation, Ventilation and Protection from Fire of School Houses." This Act is very drastic in some of its provisions, and insists on all plans deposited with the Board of Education showing in detail the proposed heating, ventilating, lighting and sanitation. The Act goes on to say: "The Commissioner shall not approve any plans that do not provide at least 15 sq. ft. of floor space and 200 cub. ft. of air space for each pupil. Provision must also be made for assuring at least 30 cub. ft. of pure air every minute per pupil, and the facilities for exhausting

the foul air shall be positive and independent of atmospheric changes." This, of course, means that no school can be built without providing mechanical ventilation of some description.

The State of Pennsylvania has also so recently as April 22nd last passed "An Act for the purpose of governing the construction of public school buildings in order that the health, sight and comfort of all pupils may be protected." The Act declares that "each classroom shall have at least 15ft. of floor space and not less than 200 cub. ft. of air space per pupil, and shall provide for an approved system of heating and ventilation by means of which each classroom shall be provided with fresh air at the rate of 30 cub. ft. per minute for each pupil, and warmed to maintain an average of 70 degs. Fahr. in the coldest weather."

These new Acts, said Mr. Sutcliffe, showed that the school authorities in America were keenly alive to the necessity of healthy school buildings, and one could not help asking when our own education authorities were going to wake up to the vital necessity of fixing some definite health standard for all schools.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Government Surveying Appointment.

HERTFORD.—FELDMESSER writes: "How can I obtain a situation as surveyor and map maker, Government or otherwise? I have a knowledge of field surveying, but wish to join a surveying party or expedition, if necessary as chairman."

For appointments in the Ordnance Survey Department application should be made to the Director-General, Ordnance Survey Department, Southampton. Examinations are held occasionally for the post of draughtsman in the Hydrographical Department of the Admiralty, particulars of which can be obtained from the Secretary, Civil Service Commission, Burlington Gardens, W.

HENRY ADAMS.

Right to Passage-way.

EALING.—WORKS writes: "I own a house on a ninety-nine years' lease, and my first floor, including the kitchen flue, is carried over a 3ft. passage which runs from the footpath down the side of the ground floor and forms a side entrance for myself and neighbour, and a back entrance for two next that. I have had a slight dispute with regard to the use made of this, and am anxious to know whether I should be within my rights in concluding this to be my property, and also in erecting a gate at the street end of same. Sketch sent (not reproduced)."

The question of the ownership of the land does not affect this case. (a) If your neighbours have used the passage-way in dispute for twenty years past they have acquired a right to do so for ever (under the "Prescription Act"). Assuming, however, that this has not been done:—(b) As the property is leasehold, I have little doubt that the roads and passage-ways were properly set out by the freeholder when the land was first built upon, and probably you will find the plan upon your lease answers all your questions; if it does not clearly

show these, why do you not apply to your head landlord for information? As the other houses appear to have no other back entrance, I much doubt whether you can stop the passage-way at all. F. S. I.

Width of Lane: Power of Council to Refuse Plans.

YORK.—F. & H. write: "We send copy of a plan (not reproduced) submitted to a rural district council for approval. The council are in possession of urban powers. They have, however, declined to pass the plan because 'North Lane,' which is the only means of access to the proposed estate, is in their opinion too narrow. Have they the power to do this, seeing that the owner of the proposed building estate does not own any other land abutting on North Lane?"

There is no doubt that the council are justified in refusing to sanction a street such as you show upon your drawings; no street can be set out of a less width than 36ft.; it must be of that width from end to end and must have at least one entrance of the full width. Apparently the first two houses you propose to erect (hatched on plan) would have a 36ft. roadway in front were the old wall and building demolished, and I think the council should sanction the erection of this pair. Beyond that they cannot go. The fact that your client would be obliged to sacrifice a large proportion of his small estate for roadmaking has nothing to do with the case; it is "his misfortune, not his fault." F. S. I.

Evening Classes in Trigonometrical Surveying.

ENFIELD.—INSTITUTE writes: "Which is the best evening school in London for the study of trigonometrical surveying?"

It would be invidious to make any distinction, but we would suggest as a very good course the City of London College (City Polytechnic), White Street, Moorfields, E.C.

Parquetry on Canvas.

PETERSFIELD.—H. T. K. writes: "Where can parquetry on canvas be obtained?"

From Messrs. The Westminster Patent Flooring Co., of King's Road, Chelsea, London, S.W., or Messrs. Damman & Co., of 34, Osnaburgh Street, London, N.W.

A Parochial Hall.

LIVERPOOL.—F. A. H. writes: "(1) What should be the superficial area of a parochial hall to seat 300, including the necessary gangways and platform at end? (2) Would 16ft. be high enough for the hall? (3) Which is the best way to ventilate the hall, which has a club-room over? Would you trust to fanlights over windows, or carry up a couple of vertical shafts through the club-room and so to the roof? If so, what area should each shaft be? (4) I believe that in one of your back numbers you gave plan and elevations of a parochial hall. What was the date of the issue?"

(1) The space allotted to each person should be not less than 2ft. 4ins. by 1ft. 8ins.; the gangways should be not less than 3ft. wide, and run down each side of the building and at the back. The platform is optional.

(2) Yes, if the roof is an open one, otherwise we should think 20ft. ought to be the minimum. (3) We should build air flues containing inlets and outlets in the form of piers on the outside walls and carry ducts from them to main outlets on the ridge. We should also advise fanlights. Each person requires about 1,800 cub. ft. of fresh air per hour, and on the "natural" system there will be draughts if the air is moved faster than about a change of four times per hour. As regards the size and position of air-ducts, you had better consult

firms who have had experience of this work, as small details affect the matter so much. The mechanical system is more certain and satisfactory, but more expensive. (4) We have published nothing suitable.

Tower of St. Alfege Church, Greenwich.

LONDON.—STUDENT writes: "Is there a book relating to, or are there any drawings of, the tower of St. Alfege Church, Greenwich? I have made a search, but without success."

There seems to be no publication whatever which gives any information relating to the tower of this church. H. Y. M.

Ventilation of Small Living-rooms.

OXFORD.—FRESH-AIR FIEND writes: "I send a rough plan (not reproduced) of two small living-rooms attached to some stable buildings. The dimensions of each are about 12ft. by 12ft. by 8'5ft. The external walls are hollow. There are no special arrangements for ventilating the rooms, and in the evenings, when the door is closed (and the windows also, usually), the atmosphere gets hot and stuffy, especially in the winter-time. How can I improve the ventilation?"

We suggest the provision of an inlet of the hopper type, such as Messrs. E. H. Shorland & Brother supply, with an outlet with mica flap in the outside wall of each room, arranged in such a position as not to cause a draught across the room to the chimney opening or the outlet ventilator, i.e., in the corners nearest the fireplace and range.

Safe Load on Steel Stanchion.

BRADFORD.—CORPORATION writes: "Please work out by Gordon's formula $p = \frac{fs}{1 + a \frac{l^2}{h^2}}$

the safe load on a steel stanchion 18ft. high, ends fixed (section sent); also give a simple method of approximately determining the result; also give constants for cast-iron, wrought-iron and steel for formula on beams, B.W. = $\frac{cad}{L}$."

The stanchion given is Dorman, Long & Co.'s 12in. by 6in. by 54 lb. rolled steel joist marked *G7, the area of which is stated in their catalogue as 15'9 sq. ins., and the least moment of inertia (direction of bending) as 31'43 in. inch-units. The approximate strength as a stanchion 18ft. high, with the ends fixed, will be given by the writer's "straight line formula" ("Designing Iron-work," 2nd series, Part 2, p. 8), 5'5 - '075 $\frac{l}{d}$, l and d being in the same units,

$$= 5'5 - \frac{0'075 \times 18 \times 12}{6} = 2'8 \text{ tons per sq. in.}$$

safe load. Area = 15'9 sq. ins.; therefore total safe load = 15'9 × 2'8 = say 45 tons. By Gordon's formula

$$w = \frac{fs}{1 + a \left(\frac{l}{d}\right)^2} = \frac{7 \times 15'9}{1 + \frac{1}{900} \left(\frac{18 \times 12}{6}\right)^2} = \frac{111'3}{1 + 1'44}$$

= say 46 tons safe load. The latest, and so far the best, formula is due to Prof. Claxton Fidler and will be found explained in the work cited above. Applied to the present case, it makes the safe load only 32'6 tons, which, if wrong, errs on the side of safety. In reply to the second question, the constants for the formula $\frac{cad}{L}$ for central breaking weight on

flanged beams are cast-iron 2, wrought-iron 6, steel 9; but the formula is used by architects, not by engineers. The latter design iron-work by allowing a safe working stress on the material, and do not go round and round the subject by finding breaking load in centre, converting it to equivalent distributed load and then applying a factor of safety to get at what they want. See "The Practical Designing of Structural Iron-work" (Spon, 8s. 6d.). HENRY ADAMS.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :			
Oct. 26	Lambeth—Convenience	Borough Council	H. Edwards, Engineer, 346 Kennington Road, S.E.
" 26	Fraserburgh—Villa	R. Gordon	W. Reid, Architect, Saltoun Chambers, Seaforth Street, Fraserburgh
" 26	Wigan—Cottages	Corporation	Borough Engineer, King Street West, Wigan.
" 27	Halifax—Additions	Campbell Gas Engine Co.	Jackson & Fox, Architects, 7 Rawson Street, Halifax.
" 27	Lewes—Police Offices, &c.	County Council	F. J. Wood, County Surveyor, Lewes.
" 28	Maesteg—Chapel	Standing Joint Committee	Beddoe Rees, Architect, 3 Dumfries Place, Cardiff.
" 28	Sacriston—Rebuilding Police-station	Education Committee	County Surveyor's Office, Shire Hall, Durham.
" 30	Bungay—Enlargement of School	Marylebone Borough Council	A. Pells, Architect, Beccles.
" 30	London, W.—Convenience	Education Committee	J. P. Waddington, Borough Surveyor, Town Hall, St. Marylebone, W.
" 30	Claydon—Enlargement of School	Guardians	G. W. Leighton, Architect, Princes Street, Ipswich.
" 31	Wirral—Infirmary, &c.	School Managers	J. H. Davies & Sons, Architects, Chester.
" 31	Plympton St. Mary—Enlargement of Cloakrooms	University College	— Gilmour, Plympton St. Mary National School, Plympton St. Mai Devon.
" 31	Nottingham—Alterations	Baptist Church	F. B. Lewis, City Architect, Guildhall, Nottingham.
Nov. 1	Cardigan—House	Rev. E. S. Roberts	B. Gwynne, The Mill, St. Dogmaells.
" 1	Bridgend—House	Education Committee	Cook & Edwards, Architects, Masonic Buildings, Bridgend.
" 1	Goole—School	North-Eastern Railway Co.	County Hall, Wakefield.
" 1	Larne—Villa	Education Committee	T. Hcuston, Architect, Kingscourt, Wellington Place, Belfast.
" 1	Newcastle-on-Tyne—Warehouse	Urban District Council	W. Bell, Central Station, Newcastle-on-Tyne.
" 3	Bradfield—School	Cilhaul Building Club	F. Whitmore, Architect, Duke Street, Chelmsford.
" 4	Radcliffe—Library	H. M. Office of Works	H. Lord, Architect, 42 Deansgate, Manchester.
" 7	Mountain Ash—Houses	Urban District Council	T. W. Millar, Architect, Mountain Ash, Wales.
" 9	Sutton—Post-office	Rural District Council	H. M. Office of Works, Storey's Gate, London, S.W.
" 11	Pontymoill—Alterations to Offices	Municipality	D. J. Lougher, Pontypool.
" 11	Chesterton—Hospital Block	Education Committee	F. T. Mullett, Architect, Downing Street, Cambridge.
" 13	Antwerp—Theatre	County Council	Hotel de Ville, Antwerp.
" 21	Gloucester—School		J. Fletcher Trew, Architect, County Chambers, Station Road, Glasgo
No date	Hounslow—Villas		E. Pennington, Architect, Richmond.
"	Henbury—Police-station		County Surveyor, Shirehall, Gloucester.
ENGINEERING :			
Oct. 26	Stowmarket—Pump, &c.	Guardians	R. E. Wilkes, Clerk, Guardians' Offices, Stowmarket.
" 26	Amsterdam—Deepening Canal	Provincial Board of North Holland.	Gebr. van Cleef, The Hague.
" 27	Preston—Boilers, &c.	Corporation	Borough Surveyor, Town Hall, Preston.
" 30	Haarlem—Roof	Holland Railway Co.	Central Administration Buildings, Holland Railway Co., Room 1 Droogbak, Amsterdam.
" 31	Falmouth—Pier Head Improvements	Hackney Guardians	F. J. Bowles, Dock Offices, Falmouth.
Nov. 1	Chipping Ongar—Laundry and Pumping Plant	Municipality	W. A. Finch, Architect, 76 Finsbury Pavement, E.C.
" 4	Ghent—Maritime Installation Improvement	Rural District Council	Hotel de Ville, Ghent.
" 8	Stratton St. Margaret—Storm-water Bed	Education Committee	Beesby, Son & Nicholas, Engineers, 11 Victoria St., Westminster.
" 9	Havana—Pier	Royal Infirmary	Cuban Consulate, London.
" 13	Oldbury—Heating Apparatus	Gas Co.	A. Long, Architect, 21 New Street, West Bromwich.
" 18	Bradford—Heating		F. Holland, Engineer, 11 Parkinson's Chambers, Hustlergate, Bradford
No date	Waterford—Gasholder		R. Bruce Anderson, Engineer, 5 Westminster Chambers, Victoria S S.W.
IRON AND STEEL :			
Oct. 26	Birmingham—Pipes	Water Committee	E. A. Lees, Secretary, 44 Broad Street, Birmingham.
" 31	London, S.W.—Rails	County Council	Engineer's Dept., County Hall, Spring Gardens, S.W.
Nov. 1	Hornsea—Water Mains	Urban District Council	W. E. Warburton, Surveyor, Public Rooms, Hornsea.
PAINTING AND PLUMBING :			
Oct. 30	Lewisham—Painting at Infirmary	Guardians	Union Offices, 286 High Street, Lewisham, S.E.
Nov. 2	Northfleet—Painting	Urban District Council	Council Offices, The Hill, Northfleet.
" 2	Barnstaple—Painting	Trustees	W. C. Oliver, Architect, Bridgend.
ROADS AND CARTAGE :			
Oct. 26	Hartlepool—Street Works	Corporation	H. C. Crummack, Engineer, Borough Buildings, Hartlepool.
" 27	Tunbridge Wells—Street Works	Corporation	W. H. Maxwell, Engineer, Town Hall.
" 27	Woking—Road Materials	Urban District Council	G. J. Woolridge, Surveyor, Bank Chambers, Woking.
" 27	Brighton—Granite Spalls	Town Council	A. Weller, Borough Surveyor, Town Hall, Brighton.
Nov. 1	Arundel—Street Improvements	Town Council	A. Holmes, Town Clerk, Arundel.
" 8	Peters Bar—Widening	Rural District Council	Mansbridge, Surveyor, 40 High Street, Barnet.
" 8	Clewer—Asphalting	Parish Council	J. H. Strange, Clerk, 4 Victoria Street, Windsor.
No date	Fairfield—Reconstruction of Street	Urban District Council	C. Flint, Surveyor, Terrace Road, Buxton.
SANITARY :			
Oct. 26	Ferndale—Sewer	Urban District Council	W. J. Jones, Surveyor, Public Offices, Pentre Rhondda.
Nov. 1	Wembley—Sewers	Urban District Council	W. Bagshaw, Clerk, Public Offices, Wembley.
" 1	Easingwold—Sewers &c.	Rural District Council	F. J. H. Robinson, Clerk, Easingwold.
" 6	Ewell—Removal of Refuse, &c.	Parish Council	G. Hards, Clerk, High Street, Ewell.
" 8	Rochdale—Sewers, &c.	Town Council	S. S. Platt, Borough Surveyor, Town Hall, Rochdale.
" 9	Murton Colliery—Sewage-disposal Works	Rural District Council	C. Rule, Surveyor, Haswell, via Sunderland.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Nov. 4	Maesteg—Chapel	—	—	W. Job, Llynir Lodge, Maesteg, Wales.
" 4	Greenwich—Library	£25, £15, £10	—	F. Robinson, Town Clerk, Greenwich.
an. 15	Hackney—Library	50, 30 and 20 guineas	£1 ts.	W. A. Williams, Town Clerk, Town Hall, Hackney.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

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Current Market Prices

Coming Events.

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	12	6	1	14	0
Clover, best ...	per load	3	12	0	4	0	0
Hay, good	do.	3	3	0	3	10	0
Sainfoin mixture ...	do.	3	7	0	3	15	0
Straw	do.	1	10	0	1	16	0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1	3	11	1	6	3
Colza Oil, English ...	do.	1	3	9	—	—	—
Copperas	per ton	2	0	0	—	—	—
Lead Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonated ...	per ton	16	0	0	—	—	—
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	0	16	9	—	—	—
Petroleum, American ...	per gal.	0	0	6 1/2	0	0	6 1/2
Do. Russian	do.	0	0	6 1/2	0	0	6 1/2
Pitch	per barrel	0	8	0	—	—	—
Shellac, orange	per cwt.	8	18	0	—	—	—
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	4	0	1	5	6
Tar, Stockholm	per barrel	1	5	0	—	—	—
Turpentine	per cwt.	2	9	9	—	—	—

METALS.

Copper, sheet, strong ...	per ton	86	0	0	—	—	—
Iron, Staffs, bar	do.	6	10	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	11	15	0	—	—	—
Lead, pig, Soft Foreign ...	do.	14	17	6	—	—	—
Petroleum, American common brands ...	do.	15	2	6	—	—	—
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	15	0	0	—	—	—
Do. pipe	do.	16	0	0	—	—	—
Nails, cut, 3in. to 6in. ...	do.	9	5	0	—	—	—
Do. floor brads	do.	9	0	0	—	—	—
Steel, Staffs, Girders and Angles	do.	6	5	0	6	12	6
Do. do. Mild bars	do.	6	5	0	6	10	0
Tin, Foreign	do.	148	10	0	149	0	0
Do. English ingots	do.	150	0	0	151	0	0
Zinc, sheets, Silesian ...	do.	31	7	6	—	—	—
Do. do. Vieille Montaigne ...	do.	31	10	0	—	—	—
Do. Spelter	do.	28	12	6	28	17	6

TIMBER.

Soft Woods.

Fir, Dantzic and Memel ...	per load	2	12	6	5	0	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American ...	do.	3	3	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Karlstorg, Yellow, 2nd, 4x11 ...	per std.	8	5	0	—	—	—
Do. do. do. 4x9 ...	do.	8	5	0	—	—	—
Do. St. Petersburg, Yellow, 1st, 2nd & 3rd, Unsorted, 2 1/2 x 8 ...	do.	8	0	0	—	—	—
Do. do. do. 3rd, 3x11 ...	do.	6	7	6	—	—	—
Do. do. do. 2 1/2 x 7 ...	do.	7	15	0	—	—	—
Do. Onega, Yellow, 5th, 3x11 ...	do.	6	15	0	—	—	—
Do. do. do. 3x9 ...	do.	7	10	0	—	—	—
Do. Quebec, Spruce, 3rd, 3x9 ...	do.	9	0	0	—	—	—
Do. Langror, Yellow, 3x9 ...	do.	6	0	0	—	—	—
Do. Norrsundet, Yellow, 3rd, 3x8 ...	do.	10	15	0	—	—	—
Do. Nederkalix, Yellow, 2nd, 3x8 ...	do.	7	10	0	—	—	—
Do. Oxelosund, Yellow, 2nd, 3x7 ...	do.	8	5	0	—	—	—
Do. Kovda, Yellow, Unsorted, 3x7 ...	do.	7	10	0	—	—	—
Do. do. do. 3x6 ...	do.	7	5	0	—	—	—
Do. Skelleftea, Yellow, Unsorted, 3x6 ...	do.	8	15	0	—	—	—
Do. Norrkoping, Yellow, Unsorted, 3x6 ...	do.	7	5	0	—	—	—
Do. Pernoviken, Yellow, 1st & 2nd, 2 1/2 x 8 ...	do.	8	5	0	—	—	—
Do. do. do. 2 1/2 x 7 ...	do.	8	15	0	—	—	—
Battens, all kinds ...	do.	6	15	0	13	0	0
Flooring Boards, prepared, 1st ...	per square	0	9	9	0	10	9
Do. 2nd	do.	0	8	6	0	10	0
Do. 3rd, &c.	do.	0	8	9	0	9	6

HARD WOODS.

Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick ...	do.	2	0	0	4	5	0
Do. Quebec do.	do.	2	5	0	4	10	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	8 1/2	—	—	—
Do. Honduras	do.	0	0	3 1/2	0	0	4
Do. Tobasco	do.	0	0	5	—	—	—
Whitewood, American, logs	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0
Elm, Quebec	per load	4	5	0	8	10	0
Jarrah, plank	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0	0	5 1/2	—	—	—
Do. Tobasco	do.	0	0	3 1/2	0	0	6
Do. Cuba	do.	0	0	3	0	0	5
Do. African	do.	0	0	3	0	0	5
Oak, Wainscot	per log	3	0	0	7	0	0
Teak, Indian, logs	per load	9	15	0	19	0	0
Do. do. planks	do.	12	15	0	20	10	0

Wednesday, October 25.

ARCHITECTURAL ASSOCIATION (Discussion Section).—Messrs. H. F. Waring and C. Wainwright on "Casements, Leaded Lights and Stained Glass," at 7.30 p.m.
ROYAL SANITARY INSTITUTE.—Mr. A. Saxon Snell on "Sanitary Building Construction and Planning; Soil and Local Physical Conditions," at 7 p.m.

Thursday, October 26.

CARPENTERS' COMPANY.—Dr. A. Wynter-Blyth on "The Sanitary Arrangements of Buildings, &c.—I.," Carpenters' Hall, London Wall, at 7.30 p.m.

Friday, October 27.

UNIVERSITY COLLEGE.—Mr. D. S. MacColl on "Sculpture: Mediæval, Renaissance and Modern," at 4.30 p.m.

JUNIOR INSTITUTION OF ENGINEERS.—Annual General Meeting and First Meeting of the Incorporated Institution, Westminster Palace Hotel, at 8 p.m.

AUCTIONEERS' INSTITUTE OF THE UNITED KINGDOM.—Opening Meeting at 7.45 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. Goodyear on "Architectural Refinements," at 8.30 p.m.

Monday, October 30.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Discussion on "Architectural Refinements," at 8.30 p.m.

Tuesday, October 31.

UNIVERSITY COLLEGE, LONDON.—Professor E. A. Gardner on "Architectural Sculptures."

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. Goodyear on "Architectural Refinements," at 8.30 p.m.

Thursday, November 2.

CARPENTERS' COMPANY.—Dr. A. Wynter-Blyth on "The Sanitary Arrangements of Buildings, &c.—II.," Carpenters' Hall, London Wall, at 7.30 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. Goodyear on "Architectural Refinements," at 8.30 p.m.

ARCHITECTURAL ASSOCIATION.—Conversazione.

Friday, November 3.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. R. Park on "Underpinning," at 8 p.m.

New Companies.

KNIGHTSBRIDGE PROPERTIES, LTD., builders, decorators, &c. Capital: £50,000.

CWMUDU QUARRIES, LTD., to adopt an agreement with W. H. Woodliffe, A. J. Colson and A. L. White, and to carry on the business of quarry proprietors, builders, contractors, &c., Ynysdu. Capital: £75,500.

STRANGE AND SONS, LTD., to acquire the business carried on at Tunbridge Wells and Tonbridge, Kent, and elsewhere, as Strange and Sons, to adopt an agreement with C. M. Strange, E. J. Strange and C. M. Strange, and to carry on the business of builders, &c. Capital: £25,000.

FRAZZI FIREPROOF CONSTRUCTION, LTD., to acquire the business carried on by A. E. Brown and E. J. Brown at Essex Wharf, Durdur Street, Whitechapel, E., as importers of and dealers in Frazzi fireproof materials, builders and constructional engineers, constructors of fireproof floors, partitions, roofs, &c. Capital: £12,000.

OXFORD PORTLAND CEMENT CO., LTD., to acquire a lease of the Washford Pits, and the rights over adjoining limestone and clay-bearing lands at Kirtlington, near Oxford, to erect works, to adopt an agreement between A. Dillon and A. J. McMillan, and to carry on the business of manufacturers of cement, plaster, &c. Capital: £50,000.

GLASGOW TECHNICAL COLLEGE.

AT the nineteenth annual meeting of the governors of the Glasgow and West of Scotland Technical College held on Thursday last the report for the past year was presented. This stated that the college had more than maintained its satisfactory position both in regard to the number of students (at present 5,671) and the standard of instruction given. Efforts have been made during the year to complete the first section of the new building in time for the coming session. This building is the largest devoted to education in Britain, and the progress made since the laying of the memorial stone by the King, less than two and a half years ago, is very satisfactory. The total expenditure to date has been £163,000.

An important addition has been made to the staff of the college by the appointment of Mr. G. Moncur, B.Sc., A.M.I.C.E., as lecturer in civil engineering. The college is now among the few in this country with a fully organized department devoted solely to this branch of engineering.

The principal change on the staff during the year has been caused by the election of Prof. W. H. Watkinson, M.I.C.E., to the Harrison chair of engineering in the University of Liverpool. His place at the Glasgow College has been taken by Dr. A. L. Mellanby, lecturer at the Manchester Municipal School of Technology.

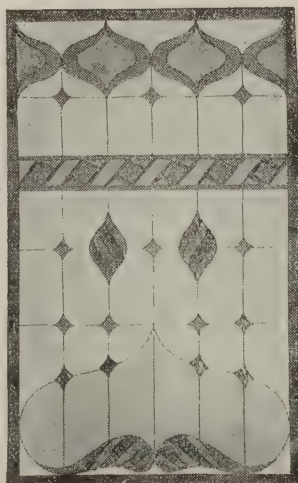
The organization of the Glasgow School of Architecture under the joint committee of this college and the Glasgow School of Art was completed during the past session, and the course of study for the joint diploma and joint certificate was adjusted. Professor Bourdon has been appointed to the position of Director of Architectural Studies, with the special duty of securing the co-ordination of the work of the two institutions in relation to the curriculum of architecture. The department of architecture, under Professor Gourlay, has been reorganized to meet the requirements of the new curriculum, and additional classes have been arranged, including new courses on masonry, brickwork and quantity surveying, and special lectures on stereotomy.

The proposals for the coming session include new lectures and drawing classes in civil engineering and surveying, a course on trees and timber intended mainly for teachers of woodwork; and drawing classes and a preliminary class in plumbing.

The Architectural Craftsmen's Society now has a membership of 117.

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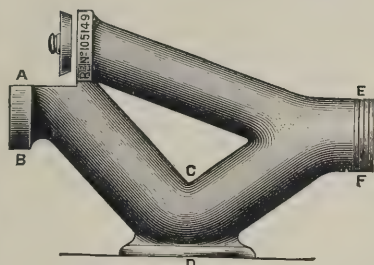
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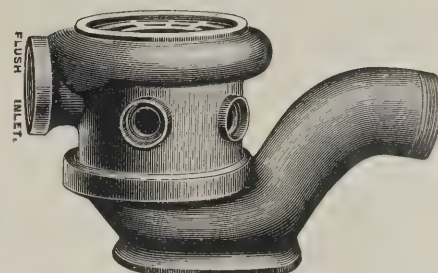


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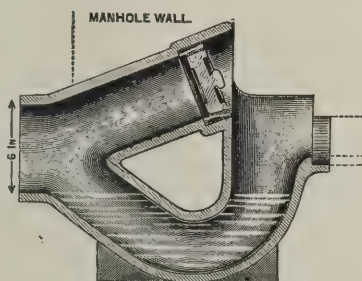
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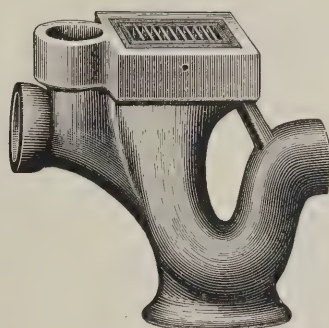
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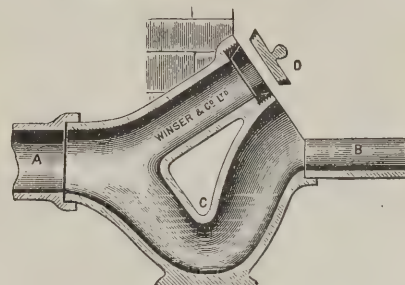
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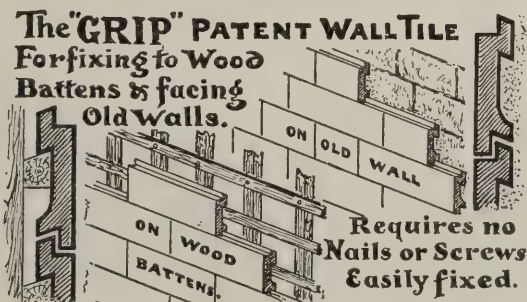
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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barnstaple.—Accepted for the erection of a new mixed elementary school, for the Education Committee:—
H. Silfiant & Son, Barnstaple ... £4,021

Birmingham.—For the erection of a tramway depot in Moseley Road, for the Corporation. Mr. Frank Barlow Osborn, F.R.I.B.A., architect, 13, Bennett's Hill, Birmingham:—

H. S. Bevins	£33,400	0	0
Gowing & Ingram	25,605	0	0
J. Dalow & Sons, West Bromwich	25,556	0	0
J. Moffat & Sons	24,999	0	0
J. Bowen & Sons	24,924	0	0
T. Elvins, Naden Road, Handsworth	24,842	0	0
A. Reynolds, sen.	24,830	0	0
W. Lee & Son	24,699	0	0
A. C. Hughes	24,679	0	0
C. G. Hill, Coventry	24,466	0	0
T. A. Smith	24,400	0	0
H. Wilcock & Co., Wolverhampton	24,356	0	0
T. A. Cole & Son, Selly Oak	24,264	9	8
G. Cave & Son, Aston	24,195	0	0
H. Lovatt, Ltd., Wolverhampton	23,991	0	0
J. Barnsley & Sons	23,966	0	0
W. & J. Webb	23,950	0	0
B. Whitehouse & Sons	23,923	0	0
Bowles & Son	23,817	0	0
W. Sapote & Sons	23,689	0	0
W. H. Gibbs	23,330	0	0
T. Johnson	23,187	0	0
W. Bishop	22,997	0	0
T. Rowbotham	22,557	0	0
T. Lowe & Sons, Burton-on-Trent	22,220	0	0

* Accepted. (Rest of Birmingham.)

Bowdon.—For alterations and additions to Parish Church schools, for the Rev. Archdeacon Gore, D.D., and school managers. Messrs. C. K. and T. C. Mayor, architects, 41, John Dalton Street, Manchester. Quantities by Mr. L. Knowles, 37, Blackfriars Street, Manchester:—

H. Ormon	£1,437
Peace & Yorquoy	1,420
J. F. Moore	1,420
J. Pennington	1,370
Hamilton & Sons	1,350
Burgess & Galt	1,320
G. Macfarlane & Son, Manchester	1,307

* Accepted.

Bushey.—For pulling down and rebuilding new premises, London Road, for the London and South-Western Bank. Mr. C. L. Morgan, architect, 43, Cannon Street, London, E.C.:—

S. W. Moscript	£2,876
Tennant & Co.	2,781
H. B. Oldrey & Sons	2,667
G. & J. Waterman	2,564
Godson & Sons	2,555
C. Brightman, Watford	2,525

* Accepted.

Fairfield.—For the erection of ten dwellings in Stanley Street, for Mr. J. Pollitt, Stanley House, Fairfield. Messrs. C. K. and T. C. Mayor, architect, 41, John Dalton Street, Manchester:—

H. Fielding	£2,500
E. Jackson	2,450
W. Q. Smith & Co.	2,275
J. Harrop, Abbey Hey Lane, Gorton	2,070

* Accepted.

Folkestone.—For alterations of Pelham House, Bouverie Road East, into a county school for girls, for the Education Committee. Mr. W. H. Robinson, surveyor:—

F. W. & J. Clark	£1,579	0	0
T. Nicholls	1,525	0	0
A. J. Camburn	1,520	0	0
T. E. Crosswell	1,475	0	0
N. White	1,390	0	0
Hayward & Paramor	1,345	0	0
R. Webster	1,339	0	0
S. Vant	1,325	0	0

J. G. Parsons	£1,300	0	0
S. Binfield, Folkestone	1,117	5	0

[Surveyor's estimate, £1,120.]

* Provisionally accepted.

Immingham.—Accepted for the construction of the proposed deep-water dock on the Humber, at Immingham, near Grimsby:—

Price, Willows & Reeves, over £1,000,000.

London, N.E.—For works at the Eastern Hospital, for the Metropolitan Asylums Board:—
Engineering work.

J. Fraser & Son, Millwall, E.	£4,984	0	0
G. H. Robinson, Derby	3,150	0	0
Wenham & Waters, Croydon	2,925	0	0
E. Danks & Co., Oldbury	2,907	10	0
Death & Ellwood, Leicester	2,900	0	0
Glover & Hobson, London, S.E.	2,900	0	0
J. Musgrave & Sons, Bolton	2,830	0	0
H. Braithwaite & Co., Leeds	2,750	0	0
Clayton, Son & Co., Leeds	2,722	0	0
T. Beeley & Son, Hyde	2,680	0	0
W. Summerscales & Sons, Keighley	2,640	0	0
J. Richmond & Co., London, E.C.	2,614	0	0
Hewitt & Kellett, Bradford	2,525	0	0
Hill & Herbert, Leicester	2,440	0	0
T. Potter & Sons, London, W.	2,418	0	0
J. & F. May, London, W.C.	2,372	0	0

Building work.

G. Wales & Co., London, N.	1,829	14	0
Gardner & Hazell, London, N.	1,759	0	0
W. Neil & Co., London, E.	1,734	7	0
T. Cole, Barnsbury, N.	1,679	11	0
Marchant & Hirst, London, N.W.	1,629	17	0
T. Gates & Sons, Dalston, N.E.	1,565	9	0
Pollard & Brand, London, N.	1,525	0	0
C. Yates & Co., London, E.	1,466	0	0
A. E. Simes, Stratford	1,400	0	0
Press, Robinson & Co., London, N.E.	1,301	6	4
W. H. Hyde, Norwood Junction	1,221	1	0
E. Streather, Croydon	1,200	0	0
E. Davey, Southend-on-Sea	1,147	2	8

[The engineer-in-chief's revised estimate for the engineering work and building work was £4,000.]

* Recommended for acceptance.

London, W.—For the contemplated conversion of 44, Castletown Road, West Kensington, into residential flats, for the Trustees. Messrs. Hayward & Maynard, architects, 30, John Street, Adelphi, W.C.:—

H. H. Perkins & Co.	£1,236
Whitby Brothers	1,050
H. Hocking	1,050

Mortlake.—For the erection of an addition to the administrative block at the hospital, South Worple Way, for the Barnes Urban District Council. Mr. G. Bruce Tones, A.M.I.C.E., surveyor:—

Mason & Gay, Carshalton	£1,667	0	0
Spencer, Santo & Co., London, S.W.	1,600	0	0
King & Son, London, S.W.	1,587	0	0
Bowyer & Co., Upper Norwood	1,565	0	0
Enness Brothers, Erith	1,520	0	0
Shelbourne & Co., London, E.C.	1,511	0	0
Harris & Co., Barnsbury, N.	1,490	0	0
Hunt & Sons, Barnes	1,470	11	0
Hughes & Co., Mortlake	1,470	0	0
G. Parker, Peckham	1,447	0	0
Mimnack & Co., London, S.W.	1,439	0	0
Brooking & Son, Richmond	1,420	0	0
E. Wall, Tooting, S.W.	1,404	0	0
Myall & Upson, Clacton-on-Sea	1,390	0	0
J. Renshaw, Putney	1,389	0	0
A. Heywood, Hammersmith	1,379	0	0
Almond & Sons, Ponders End, N.	1,370	0	0
W. H. Hyde, Norwood Junction, S.E.	1,322	0	0
J. & W. Drake, London, W.	1,311	0	0
W. Lowe, 199, Castelnau, Barnes	1,307	0	0
J. Christie, Uxbridge Road Station	1,233	0	0

* Accepted.

St. Dogmell.—For additions to schools, for the Education Committee. Mr. D. Edward Thomas, architect, 17, Victoria Place, Haverfordwest:—

Williams & Son, Cardigan	£1,357
Cole & Sons	1,159

* Accepted.

Tunbridge Wells.—For additional classrooms at St. James's National Schools. Mr. C. H. Strange, A.R.I.B.A., architect:—

W. B. Jury & Sons	£716	0	0
J. N. Jeffery	687	16	0
Beale & Son	665	0	0
Jarvis & Son	664	0	0

* Accepted. [All of Tunbridge Wells.]

Continued on p. xxiii.

ROOFING SLATES:

Velinheli, Penrhyn, and Westmoreland.

SLATE SLAB GOODS:

Both Plain and Enamelled.

ALFRED CARTER & CO., LIVERPOOL.

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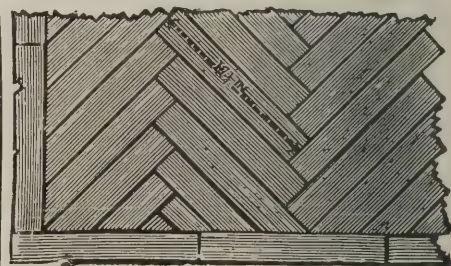
ESTABLISHED 1851.

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Deposits. 2½% Interest allowed on Deposit Accounts. Advances made. Stocks and Shares bought and sold.

Apply Secretary, Southampton Buildings, High Holborn, W.C.

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Per 100 Blocks out of sizes.	YELLOW.		PITCHPINE	
	At Wharf.	ex Ship within one Month.	At Wharf.	
17½ x 3 x 3	12 9	12 0	16 6	
17½ x 3 x 2	8 3	7 9	11 5	
17½ x 3 x 1½	6 9	6 3	9 0	



PRIME DRY OAK & PITCH PINE FLOORINGS

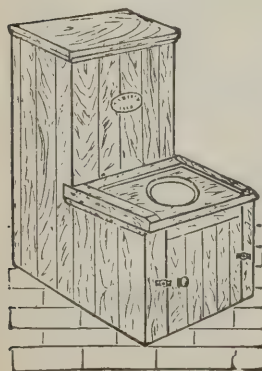
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These prices do not include desiccation.

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CATALOGUE ON APPLICATION.

Works: Link Street, Morning Lane, Hackney, N.E.
London Office: 27, QUEEN STREET, E.C.

TENDERS—cont. from p. xxii.

Rhyl.—For taking down the old police-station building and for the erection on the site of a public free library and extension to the town hall, for the Urban District Council. Mr. Arthur A. Goodall, town surveyor:—
G. Roberts & Brothers, Llandudno £2,878
D. Griffiths & Son, Rhyl... .. 2,830
W. Hopkins, Birmingham 2,700
J. & G. Chappell, Liverpool 2,565
A. Torkington, Rhyl... .. 2,513
W. Thornton & Sons, Liverpool 2,509
Parker Brothers, Chester 2,498
S. Butterworth & Sons, Blackpool 2,450
C. Griffiths, Lye, Stourbridge 2,427
Jones & Pritchard, Abergella... .. 2,426
* Accepted.

Wanstead.—Accepted for the erection of three villa residences at Wanstead. Mr. H. Riches, architect, 3, Crooked Lane, King William Street, London, E.C.:—
Clement Brothers £1,940

Weston-under-Wetherley.—For the erection of a vestry to St. Michael's Church. Mr. Francis P. Trepass, architect, 1, Church Street, Warwick. Quantities by architect:—
E. Tallis, Warwick £273 15 0
G. F. Smith & Sons, Leamington 240 0 0
J. C. Cashmore & Sons, Warwick 228 10 0
E. Smith & Son, Kenilworth 215 0 0
* Accepted.

Worthing.—For the erection of an infants' school on a site in Little High Street, for the Education Committee:—
J. Martin, Eastbourne £5,426 14 3
W. A. Field & Co., Brighton 5,283 0 0
W. J. East, Worthing 5,225 0 0
W. Brown & Sons, Brighton 5,219 0 0
Rowland Brothers, Horsham 5,049 0 0

J. Langley & Co., Crawley £4,989 0 0
Peerless, Dennis & Co., Eastbourne 4,961 0 0
J. H. Lelliott, Worthing 4,960 15 0
J. Linfield & Sons, Littlehampton ... 4,917 0 0
R. Coo'k & Sons, Crawley 4,884 0 0
J. A. East,* St. Matthew's Road, Worthing 4,555 15 2
* Accepted.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending October 20th twenty-seven failures in the building and timber trades in England and Wales were gazetted.

G. BROCK, builder, Longstock. R.O. Oct. 11th.
H. OSWIN, builder, Walsall. R.O. Oct. 11th.
J. HALLETT, builder, Sutton. R.O. Oct. 10th.
H. MARTER, builder, Kingston Hill. R.O. Oct. 11th.
W. BRIGGS, plumber, Leeds. Adj. Oct. 13th.
W. B. ASHBY, builder, Derby. Deficiency £1,683.
F. T. PENNY, builder, Northfield. Deficiency £831.
J. WILLIAMS, builder and contractor, &c., Swindon. Liabilities £6,095; estimated assets £2,830.
A. GELDER, builder, Leeds. Liabilities £3,002; assets £2,389.
T. E. EDMUNDS, builder, Saltley. Liabilities £1,745; assets £438.
E. L. MORGAN, builder, Upper Boat. P.E., Pontypridd C.C., Nov. 21st, at 11.15.

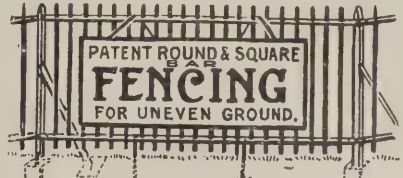
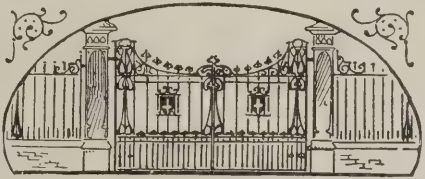
G. J. MULLETT, builder and contractor, Dudley. Deficiency £234.
R. AIRRY, painter and decorator, Blackburn. R.O. Oct. 11th.
G. BROWN, builder and contractor, Great Witchingham, P.E., Shirehall, Norwich, Nov. 22nd, at 11.
W. C. BROADHURST, builder and contractor, Stockport. Adj. Oct. 13th.
S. PEERS, painter, Derby. P.E., Derby C.C., Nov. 14th, at 11.
J. A. CRAIG, builders' material merchant, Southend-on-Sea. Adj. Oct. 11th.
W. SMITH, builder and contractor, Farnborough (late Blackwater). R.O. Oct. 9th.
G. YEOMANS, builder and contractor, Farnborough. Adj. Oct. 13th.
S. REYNOLDS, builder, Ystrad Rhondda. First meeting, 135, High Street, Merthyr Tydfil, Oct. 30th, at 12. P.E., Pontypridd C.C., Nov. 21st, at 11.15.
W. WHELAN, plumber, Brighton. First meeting, O.R.'s, Brighton, Oct. 26th, at 10.30. P.E., Brighton C.C., Nov. 9th, at 11.
J. SAXTON, plumber, Hucknall Torkard. First meeting, O.R.'s, Nottingham, Oct. 25th, at 12. P.E., Nottingham C.C., Nov. 3rd, at 10.
H. A. COLLISON, builder and contractor, Norwich (late Lowestoft). P.E., Great Yarmouth Town Hall, Nov. 7th, at 11.
C. G. TOWNSEND, builder, Deal. First meeting, O.R.'s, Canterbury, Oct. 26th, at 12. P.E., Canterbury Guildhall, Oct. 26th, at 10.
BONSEY & BAIGENT, builders, Walton-on-Thames. First meeting, 24, Railway Approach, London Bridge, Oct. 25th, at 12.30. P.E., Kingston C.C., Nov. 7th, at 2.30.

GROBAK

GREEN SLATE QUARRIES.

The attention of Architects is called to these beautiful Green Slates, which are now available for the British Market.
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FENCING
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The 9th annual issue of SPECIFICATION is now being prepared for press, and as for the last three years the supply has not been sufficiently large to meet the requirements of our subscribers we are giving this early notice in order that those who are desirous of securing a copy of this number can do so by placing their orders at once.

To Advertisers

Advertisement space is now being rapidly booked and intending advertisers are requested to send us particulars of their requirements without delay. Our representative will be pleased to call and give any information which may be required.

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The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

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ARCHITECT'S ASSISTANT (A.R.I.B.A.) desires immediate RE-ENGAGEMENT in Provinces. Large varied experience good class Provincial work. Design, details and experienced Quantity Surveyor. Excellent testimonials. Very moderate salary.—"EXPERIENCE," Box 1380, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT, 20 years' general experience, desires TEMPORARY ENGAGEMENTS (Lancashire preferred) as Assistant. Expert designer, draughtsman, surveyor, quantities, perspectives, &c. Terms moderate. Box 1399, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT (26) with several years' provincial and London experience desires ENGAGEMENT as Assistant. Good all-round man.—G., "The Poplars," Collyweston, Stamford. 1440

ARCHITECT'S JUNIOR ASSISTANT, DIS-ENGAGED October 10th; Good draughtsman, colourist, &c.; mod. sal.—H. J. C., 63, Edinburgh Road, Queen's Park, Northampton.

ARCHITECT'S JUNIOR ASSISTANT desires a change. London or Provinces. 5 years' experience. Salary to be arranged.—A. G. S., "Kirkdale," Stanmore Road, Leytonstone, Essex. 1386

ARCHITECT'S JUNIOR ASSISTANT seeks ENGAGEMENT. 4½ years' experience. Good draughtsman, tracer, colourist and typist. Knowledge of quantities and specifications. Usual office routine. Lincolnshire or Yorks. preferred. Good references.—Box 1401, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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ARCHITECT'S JUNIOR ASSISTANT desires engagement in or near London. Accurate draughtsman and tracer; excellent knowledge of construction and quantities. Good references.—A. G. O., 117, Brighton Road, Croydon. 1423

ARCHITECT'S JUNIOR ASSISTANT, 24. Good tracer and colourist, neat draughtsman. Prob. R.I.B.A.; 5 years' experience; salary 25s.—A. C., 46, King Henry's Road, N.W. 1381

ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT requires situation in Architect or Builder's office. Four years' experience; good draughtsman, tracer, &c. Moderate salary.—A. C. W., "Owlscot," Purley, Surrey. 1425

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CLERK. Advertiser desires part-day situation, hours from 10 till 5.30 or 6.—G. D., 147, Victoria Road, Kilburn, N.W. 1416

GENERAL FOREMAN BRICKLAYER at liberty. Town or country. Thoroughly competent. Five years last (London) employer, to whom references permitted. Good disciplinary, timekeeper, &c.—G. L., 58, Rosslyn Crescent, Wealdstone. 1426

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HEAD DRAUGHTSMAN & DESIGNER, Faience and Tile Trade, seeks ENGAGEMENT; 16 years' wide experience with a leading firm.—Box 1405, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

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PRACTICAL SURVEYOR is willing to give occasional assistance in getting out details of steel and heavy constructional works, electric lighting stations, chimney shafts, and fire work generally, supplying quantities or taking off only. Variations adjusted.—Box 1415, BUILDERS' JOURNAL Office, 6, Great New Street, E.C.

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ARCHITECTS COMMENCING.—Architect retiring would make over business and offices on very reasonable terms. Rent £35; city.—C. E., 36, Westwell Road, Streatham Common.

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WANTED Back Numbers of the "Architectural Review," dated May and July, 1902.—Box 1388, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

WANTED.—"Building News," "Builder," &c., any or all last ten years, cheap and clean.—W. B., "Holman," Bishopric, Horsham.

WANTED.—Good set of ELECTRUM DRAWING INSTRUMENTS.—H. S., 55, St. Martin's Street, Hereford.

MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 13.
October, 1905.

LEGISLATION.

THE laws, by-laws, rules and regulations governing the erection of buildings are being multiplied from year to year, and amongst the official requirements which have been more recently extended those relating to fire-prevention must necessarily be given greater attention than heretofore, having regard to the importance being attached to them by the various local authorities. Both architects and builders have been somewhat prone to give requirements as to fire-prevention second place, and as a matter of fact many requirements are entirely overlooked until they are officially reminded of them by the authorities. Apart from the official requirements, various rules are nowadays also enforced by the insurance corporations which demand every possible attention, for only by proper observance are obtainable rebates on the insurance rates and classification for moderate rating dues. Having regard to the importance of this question, we are in this supplement devoting special attention to rules and regulations.

The article on the subject by Mr. James Sheppard, the leading authority in this country on legislative enactments of this description, is an important one and we print the full text of the Standard Fire Rules as issued by the tariff offices, as also the schedule of fire-resisting materials as amended during the last session of Parliament, which regulations in their amended form are, however, not yet generally known.

EXISTING BUILDING REGULATIONS FOR PROTECTION FROM FIRE, WITH SUGGESTIONS.

By JAMES SHEPPARD, A.Inst.E.E.,
Insurance Surveyor.

Introduction.

Waste of life and property from fire has been and continues to be a scourge of communities in all parts of the habitable globe. As a result of such experience fire, although a good servant," is universally acknowledged to be "a bad master." Regulations relating to fire-protection are made with the object of lessening these evils and retaining fire within the limits of useful service.

The requirements of manufactures and commerce, with other necessities of civilization, leads to the accumulation of population and buildings in favoured localities. The full employment of these, unless under suitable control, involves great and increasing liability to fires, with attendant danger to life, and also the probability of sweeping conflagrations.

It is an important part of the duties of national and municipal governments to adopt, amend and enforce efficient laws and regulations for the avoidance as far as possible of evils above referred to.

The application of suitable regulations for securing sanitary dwellings, workshops and factories has done much to improve the health and lower the death-rate of the

nation, but regulations hitherto adopted in the United Kingdom with the object of lessening the loss of life and waste of property by fire have been far less successful. This unsatisfactory result may be explained by unwise concessions to the demands of combinations of land and building owners, manufacturers, traders and others when framing regulations for protection from fire, together with the absence of liability on occupiers of premises where fires originate for suitable fines or the costs of enquiries, as in the case of boiler explosions under the Acts of 1882 and 1890, or for damage that may result from such fires to the property of adjoining owners.

Insurance against fire is a necessity in modern conditions of life and trade, but the facilities it offers to individuals to guard against personal loss may tend to lessen carefulness and so increase the number of fires. Fire insurance is based on the beneficent principle of mutual help, simply distributing losses by fire over the whole body of insurers, but such losses are none the less absolute national waste. The destruction of an industrial establishment which may be the chief support of a small town causes serious distress among the employees and others, some of whom may find it necessary to obtain relief from public funds, thus adding to the burden of the district towards which the establishment destroyed ceases for a time to contribute. It is, therefore, to the public interest, both nationally and municipally, to lessen waste by fire in every possible way, and this altogether apart from any question of fire insurance, the cost of which must be ultimately controlled by the average amount of loss on the various classes of property insured, and would, therefore, be reduced by suitable action on the part of public authorities.

The restraining influence exerted by the increased cost of fire insurance to the public, resulting from numerous fires and conflagrations, is, unfortunately, under present practice not operative until too late—that is, after the evils resulting from excessive fire waste have fully developed.

This was the experience of Liverpool previous to 1843, leading, in addition to the Liverpool Improvement and Building Act of 1842, to the passing of the Liverpool Fire-prevention Acts, 1843 and 1844. Important clauses in these Acts are retrospective, and they contain provisions for meeting the cost of making required alteration and improvement in warehouses existing when the Act came into operation. Other cities and towns, although having similar experiences, have not hitherto followed Liverpool's example in securing special Fire-prevention Acts.

Property owners instinctively consider how they can secure the largest return for capital invested in land and structures; this, especially in the case of commercial centres, results in the erection of buildings to obtain on a given site the maximum amount of floor area and light at a minimum cost. Public evils resulting from personal financial con-

siderations of this nature are liable to be still further increased in cases where the land is the property of one capitalist and the building the property of another, the whole reverting to the landowner after a term of years. The crowding together and the use of buildings erected on this principle involves most serious danger not only of ordinary fires but also of disastrous conflagrations. The liberty of the subject in this respect needs to be controlled by suitable laws for the safeguarding of the public interest.

Protection from Fire.

The term "protection from fire" may be taken to include provisions under each of the following heads:—

(1) Laws and regulations with regard to structures and to appliances for their artificial warming and lighting adopted with a view to prevent fires occurring and to retard their extension if they should occur.

(2) Regulations for the transit, storage and use of specially inflammable or dangerous substances and the mode of warehousing merchandize and general goods.

(3) Provision of suitable water-supply, with appliances and organizations for the early discovery and extinction of fire and the saving of life and property from fire.

(4) The preparation of annual returns clearly showing for future guidance the work of such organizations, with the nature and extent of successes and failures, the causes of failures and of fires in different districts under their care.

(5) The discovery and punishment of persons causing fires wilfully or by gross negligence.

The subject, therefore, covers a very wide field. Prevention being admitted on all hands to be better than cure, it may be well to restrict the following remarks chiefly to the first part of the subject, namely, fire-prevention and provisions for retarding its extension.

The by-laws in use throughout the United Kingdom for the prevention of fires in buildings are for the most part made under powers conferred by—

The Towns Improvement Clauses Act, 1847, s. 109.
The Public Health Act, 1875, s. 157.
The Public Health (Ireland) Act, 1878, s. 43.
The Public Health (Scotland) Acts, 1867 and 1879.
The Public Health Amendment Act, 1890, s. 23.
The Factory and Workshops Act, 1901, ss. 14, 15, 16 and 153

Numerous Building and Improvement Acts containing clauses relating to fire-prevention have been obtained by different corporations and local authorities, the more important of these being:—

Liverpool Building, Fire-Prevention and other Acts, 1842 to 1893.
Manchester Improvement and Corporation Acts, 1844 to 1891.
Dublin Improvement and Corporation Acts, 1851 to 1890.
London Building Acts, 1804 to 1905.
Glasgow Building Regulation Act, 1900.

Many of the regulations adopted under powers conferred by the foregoing Acts are contained in the Model By-laws issued by the Local Government Board in 1877, reprinted in 1901; these by-laws are used in the following remarks for comparison.

The object of the regulations as regards fire is usually stated to be "for securing stability and the prevention of fires." The London Building Act states its object with reference to fires to be "the sound construction of building"—"the diminution of the dangers arising from fire."

1. Provision in building laws, by-laws and regulations for the prevention of fire applicable to the United Kingdom may be considered in the following order:—

Definitions.—(a) When existing buildings are to be subject to regulations applicable to all new buildings.

(b) Definition of different classes of buildings in accordance with their use or intended use and of the material and work approved for their construction.

Fire Prevention.—(c) Rules adopted to prevent the occurrence of fire.

(d) Rules adopted with the view of retarding the spread of fire throughout the building in which it may originate and for preventing its spread to surrounding buildings.

(e) Administration of the foregoing laws and by-laws.

Definitions as to existing Buildings.

(a) The definition of what is to constitute a new building is of considerable importance, as upon this largely depends the ultimate application of existing regulations to old buildings, but such definitions vary widely in the by-laws applicable to different districts.

By-laws made under the authority of the Public Health Act, 1875, are subject to section 159, which reads: "For the purpose of this Act the re-erecting of any building pulled down to or below the ground floor or of any frame building of which only the framework is left down to the ground floor, or the conversion into a dwelling-house of any building not originally constructed for human habitation, or the conversion into more than one dwelling-house of a building originally constructed as one dwelling-house only, shall be considered the erection of a new building."

By-laws adopted under powers conferred by most of the local Acts obtained by different cities and towns, or made under the Public Health (Ireland) Act, 1878, s. 43, usually provide that "whenever any building has been taken down to an extent exceeding one-half of such building measured in cubic feet, the rebuilding shall be considered the erection of a new building." This agrees with corresponding provisions in the London Building Act, 1894, s. 5 (6), and the Glasgow Building Regulation Act, 1900, s. 4, but other important cities adopt the definitions in the Public Health Act, 1875, above recited.

The Metropolitan Act, 1855, s. 10, now repealed, in addition to the clause last named, provided that "every portion of such old building that is not in conformity with the regulations of this Act shall be forthwith taken down." This provision may be implied in the present rule, but a definite statement on this point is desirable.

The expression "new building" should certainly have the same meaning and application in all by-laws and regulations.

Classification of Buildings.

(b) A classification of buildings is necessary for the purpose of applying the rules applicable to each class. It is therefore important to give clear and correct definitions, so that all buildings may be subject to suitable regulations. The following divisions are usually adopted, but the definition of each class is not the same in different districts:—(1) Public buildings; (2) buildings of the warehouse class; (3) domestic buildings; (4) dwelling-houses.

The definitions of a public building vary chiefly with regard to the exclusion or inclusion of hotels, restaurants, common lodging-houses, homes, refuges or shelters when such buildings extend to more than 250,000

cub. ft. (in some by-laws 100,000 cub. ft.) or have sleeping accommodation for more than 100 persons. It is certainly desirable to place hotels of even smaller extent than 250,000 cub. ft. under the rules applicable to public buildings, in whatever district they may be built. In some cities, including Glasgow, all hotels and restaurants, not being merely shops so used, are classed under public buildings.

The definition of buildings of the "warehouse class" varies considerably in different regulations. Under the Model By-laws of the Local Government Board this class is stated to mean "a warehouse, factory, manufactory, brewery or distillery"; to this the London Building Act adds "and any other building exceeding in extent 150,000 cub. ft. which is neither a public building nor a domestic building." In the Bill prepared with a view to the 1894 Act the words "dwelling-house" are used, but unfortunately so far as fire-protection is concerned these have been replaced in the Act by the words "domestic building," thus allowing the erection of buildings for occupation as warehouses, stores, shops and workrooms in crowded districts in such a way that they fail to retard the spread of fire to surrounding buildings of a similar construction and occupation. In the Metropolitan Building Act, 1855, regulations now only applicable to warehouse buildings as defined in the present Act were applicable to a "warehouse or other building used either wholly or in part for the purposes of trade or manufacture"; in this and some other respects the London Building Act of 1894 is retrogressive. Under the Liverpool Improvement Act, 1882, where buildings combine characteristics of more than one class, the corporation may decide to which class such building or any part shall be deemed to belong.

In the Glasgow Building Regulation Act, 1900, a building of the "warehouse class" means a warehouse, factory, manufactory, brewery or distillery or similar building, and includes (1) a building exceeding in cubical extent 150,000 cub. ft., used or constructed to be used wholly or principally as offices or counting houses; and (2) any other building (not a public building) exceeding in extent 150,000 cub. ft. which is not an hotel, lodging-house, home, refuge or shelter, and does not consist wholly or principally of dwelling-houses. The last definition embraces most commercial and trade buildings, and properly places them under regulations applicable to buildings of the warehouse class. It is desirable that a similar definition should be adopted for London and all commercial cities, omitting the words "or principally" in clause 2 and reducing capacity limit to 100,000 ft.

Most by-laws are in agreement with regard to the definition of a "domestic building," which in the London Building Act, 1894, includes a dwelling-house and any other building not being a public building or of the warehouse class. The term "dwelling-house" hardly admits of any other definition than that of a building used wholly or principally for human habitation.

The foregoing statements with regard to definition indicate the importance of a clear description of the buildings to be included in the "warehouse class." All buildings throughout the United Kingdom having a capacity exceeding 100,000 cub. ft., and situated adjoining or within 30 ft. of any other building, and not being entirely dwelling-houses, nor buildings subject to regulations applicable to public buildings, should be subject to requirements applicable to buildings of the "warehouse class." Where such buildings are situated in congested areas, which occur in all progressive and in some old cities, further special regulations should be applied.

The London Building Act, 1894, and recent

by-laws of some other cities, give definitions for "fire-resisting materials," but the list of such materials contained in the second schedule of the London Act which is followed in other cases confuses the term "fire-resisting" with "incombustible." Experience conclusively proves that incombustible materials are not necessarily "fire-resisting." Granite and stone, for instance, allowed in item 2 of the schedule, disintegrate under the action of heat and the rapid changes of temperature which occur during a fire; such materials are most unsuitable for use as corbels, and if used for detached columns or piers would be specially dangerous. The unreliable nature of stone under the action of fire is recognised in item 6 of same schedule, which provides that flag stones, when used for floors over arches, must not be exposed on the underside and not supported at the ends only, if they are to be accepted as "fire-resisting."

Iron and steel, allowed in item 3 of the schedule, to be used for beams and columns, expand considerably when heated, before material loss of strength occurs, and thrust out walls on which they may have a bearing, and then on cooling rapidly contract and further displace the walls. It is very doubtful if the displacement of walls in this way, and consequent spread of fire, can be prevented (when iron and steel beams are heavily loaded) by the provision of a space at the end of metal beams, as required by s. 5 (2) of the London Building Act. The L.C.C. have powers to make by-laws for the protection of ironwork used in the construction of buildings from the action of fire, under s. 164 of the London Building Act, 1894, but have not apparently issued such regulations.

Iron or steel where used in buildings constructionally cannot be considered "fire-resisting" unless thoroughly protected against the absorption of heat in a suitable manner by incombustible non-conducting material. The necessity of protecting metal is recognized in item 4 of the schedule of the London Building Act, which requires, where hard wood is used in combination with iron for beams or posts, the timber and iron (if any) to be protected by plastering in cement or other incombustible non-conducting external coating, before such beam or post can be accepted as fire-resisting. The need of this is also acknowledged in the regulations made by the L.C.C. with regard to theatres, section 18 of which requires all constructional ironwork to be embedded in fire-resisting material. The Glasgow Building Regulation Act, s. 17, requires iron beams or columns supporting any main wall within a building to be suitably protected against fire by plaster or cement or other fireproofing material $\frac{1}{2}$ in thick.

Slate, also allowed as being "fire-resisting," is one of the most treacherous materials used in buildings. When under the action of fire, and if used for corbels as suggested in item 5 of the schedule of the London Building Act, would be most dangerous. Slate as a roof-covering, although light, is cold in winter and hot in summer, desiccating all woodwork immediately under it, which in the event of fire in an adjoining building may be ignited even through the slates, and in any case the slates quickly break up, leaving woodwork exposed to flames.

Large timber structures covered with thin slates not allowed on the ground level are sanctioned on the top of buildings where in crowded districts they are infinitely more dangerous. In such positions the provision of flat solid roofs should be insisted upon.

The use of stone and pit or Thames ballast containing large pebbles for concrete causes the concrete to split under the action of continued heat. Broken bricks, clinkers or hard-burnt clay ballast should be used for fire-resisting concrete.

The use of stone for templates, corbels,

lintels and jambs as suggested in most building by-laws should be avoided as far as possible, brick and cast-iron duly protected being equally cheap and far safer under the action of fire for such purposes.

Regulations controlling construction with the object of preventing the occurrence of fire.

(c) The cause of nearly all "serious" fires is undiscovered, but experience leads to the definite conclusion that a large majority of these fires result from structural defects, and such fires usually originate in connection with flues, fireplaces, stoves or furnaces, to which building regulations give considerable attention, but all allow the construction of flues (at a greater angle than 45 degs. with the horizon) from ordinary open fireplaces with 4½ ins. only of common brickwork between the inside and outside of the flue. This in the case of flues subject to the wear and tear of constant use with coal fires and the impossibility of proper internal repair, cannot be expected to give reasonable security during a long term of years. Flues of this nature utilized for modern stoves are responsible for the destruction of numerous county mansions and for frequent fires in towns. The upper part only of a flue taking a course at an angle of less than 45 degs. with the horizon is required to be gins. thick.

By-laws usually require that flues from any oven, furnace, steam boiler or close fire, used for any purpose of trade or business, or from a cooking apparatus in any hotel or restaurant, be surrounded with brickwork gins. thick for a distance of 10 ft. or to the ceiling of the room next above the floor on which the oven, &c., may stand.

The hottest part of a flue is not always in that portion within 10 ft. of the fire, but is often 50 ft. or more distant, where bends exist, causing the accumulation of heat. If it is necessary to require gins. of brickwork round the portion of a flue that may be within 10 ft. or 20 ft. of the fire, it is equally necessary, if reasonable security is desired, that the thickness of gins. should be continued for the whole length of the flue, and not stop at a weak point where floor timbers and wood skirting are allowed close to 4½ in. brickwork and plaster surrounding the flue.

It is usual to require the inside of flues to be pargeted or rendered, but the Manchester by-laws also allow the brickwork on the inside of flues to be pointed only. This forms a preferable finish, especially if the face of the work is brushed over with thin cement grout. When pargeting is used coring openings must be left, and even then in a high building it is often necessary to cut numerous other openings into a flue to remove fallen pargeting; the building-up of all these openings necessarily leaves the flue at these points more or less defective. Some by-laws require the outside of all flues within the building, where the enclosing brickwork is less than gins. thick, to be plastered, but many only require this plastering at points where woodwork or timber is nearer than 2 ins. to the face of such brickwork. In the London Building Act and other by-laws both provisions are included, but this tends to weaken the force of the first provision, which if duly carried out—which often, unfortunately, it is not—necessarily meets the second requirement.

The Dublin by-laws require the inside of every flue to be lined with fireproof piping of stoneware at least 1 in. thick, and the spandrel angles filled in solid with brickwork or other incombustible material.

If enclosures to flues only 4½ ins. thick are allowed, the use of bricks of a special material and form to provide greater security should be required.

Far more stringent rules with regard to the construction of flues are enforced in Continental and American cities than any adopted in the United Kingdom.

(To be continued.)

**INSURANCE COMPANIES' REGULATIONS
As to Building Construction.**

SOME reference has been made from time to time regarding the rules of the insurance companies as represented by the Fire Offices' Committee, but our attention has been called to the fact that quite a number of architects and builders do not appear to be aware of the existence of the General Standard Fire Office Rules on matters of building construction.

This is probably due to the policy of the Fire Offices' Committee heretofore observed of not publicly issuing their regulations but practically only sending them out on demand. It is only latterly that the Fire Offices' Committee has come out of its shell to any extent and circularized its rules, this measure perhaps being due to the fact that one tariff company, some time back, published the rules for the use of its own agents as a kind of bait to show the advantages obtainable if business were done through their agency.

Why greater publicity should not have been accorded earlier to the rules in question we know not, except if it be the somewhat short-sighted policy on the part of some of the senior companies, who imagine that anything savouring of a policy of fire-prevention might harm their businesses and annual premium turnovers, not realizing that fire-prevention in its best sense and practised in moderation is the true friend of the insurance companies and leads to larger turnovers at less risk and at rates that are easily manageable and encourage full insurance. There is, of course, already a change in the feeling in certain directions, and it is due to this change in feeling that the last few years have seen any kind of standard rules formulated which are a step in the right direction.

For reference purposes we publish the more important rules. Speaking generally, they are sound and moderate. They contain some features of faddism, it is true; and in certain directions the requirements are antiquated, as, for instance, in respect to armoured, i.e., tin-clad doors. But in two directions they are certainly thoroughly up-to-date, namely, regarding reinforced concrete and fire-resisting glazing, where the rules are mainly based on the experience gained by accurate research work. Observance of these rules will ensure a reduction of rate.

We only omit to publish those rules relating to sprinklers, which are somewhat of a too specialist character for dealing with under this heading. Apart from the rules here published, the insurance offices also have what might be termed a confidential guide to their surveyors which has not yet been made public property.

RULES OF THE FIRE OFFICES' COMMITTEE.

I.—Standard Fire-resisting Buildings (not including Cotton Mills, Flax Mills, Woollen Mills and Worsted Mills).

Buildings to be deemed of Standard Fire-resisting Construction must conform to the following description.

Height and Cubical Contents.

1. Height not to exceed 80 ft., measured from the lowest point of the land level or ground line of the site on which the building stands to the level of the highest part of the roof.

2. Cubical contents of any one compartment not to exceed 60,000 cub. ft.

N.B.—In computing the cubical contents of a compartment, the floor area, excluding doorway and window recesses, and the actual height from floor to ceiling, are to be measured. Due deduction may be made for a sloping roof.

Walls and Partitions.

3. Brick, terra-cotta and/or cement concrete composed of broken brick, burnt ballast, furnace slag, clinker or other similar hard and burnt material.

4. No external area or party-wall to be less than 13 ins. thick in any part, or if of concrete 2 ins.

N.B.—Stone used externally only as ashlar or facing, with a backing of brickwork not less than 13 ins. thick, and for dressings, sills, string-courses and cornices, allowed.

5. All internal partitions to be of incombustible material, excepting only office enclosures of hard non-resinous wood with or without glazing.

6. If there is any building adjoining, the dividing or party-wall to extend at least 3 ft. above the roof of the fire-resisting building.

Flues.

7. All flues to be built of brickwork, no part of which towards the interior of the building is to be less than gins. thick, and all furnace flues to be lined with firebrick throughout for a distance of at least 20 ft. from the furnace. No timber or woodwork to rest in or be plugged into the brickwork of any flue.

Openings in Walls.

8. The total superficial area of openings in each external or area wall of any storey above the ground storey not to exceed one-half of the area of the wall (measured as to height from floor to ceiling of the storey in which the openings occur). All loop-hole or teagle doors and frames and window frames and sashes to be of iron or other hard metal. All windows above the ground storey to be glazed with glass not less than ¼ in. thick, in sections not larger than 2 super. ft., or wired glass, or electro-copper glazing in accordance with the rules of the Fire Offices Committee in force when such glazing is provided.

9. Every window or other opening above the ground storey opposing (whether directly or diagonally) and within 2 ft. of any window, skylight or glazed or other opening in any other building (whether such latter window, skylight or opening be protected or not), or overlooking (whether directly or diagonally) and within 2 ft. of the roof of any building to be protected by "fireproof" shutters or "fireproof" doors.

Floors.

10. Brick arches, terra-cotta, fireclay, or concrete as above described, the floor being in no part less than 6 ins. in thickness, and carried on metal joists, girders and columns, or brick walls or piers.

N.B.—Floors of wood not less than gins. thick, ceiled with plaster on metal lathing and with the floor boards laid on the bearers without intervening space, allowed.

11. Wooden flooring laid on concrete allowed provided there is no space between the wood and the concrete. Wooden fillets not exceeding 2 ins. deep permitted if bedded flush in the concrete.

12. Scuppers to carry off water the opening of each of which shall not be less in area than 21 super. ins. to be provided in the external walls to each floor above the ground storey at intervals of not more than 12 ft.

N.B.—In buildings within the City of London or within the area controlled by the London County Council scuppers are not essential.

Roofs.

13. Roofs to be entirely of the incombustible materials as described for floors in Rule 10, except that 4 ins. be substituted for gins. in thickness.

NOTE.—Glass not less than ¼ in. thick in sections not exceeding 36 super. ins. set in iron or other hard metal, and wired glass or electro-copper glazing in accordance with the rules of the Fire Offices Committee in force when such glazing is provided, shall for the purpose of this rule be deemed incombustible.

Outlets on to roofs rendered necessary to satisfy the requirements of the Factories and Workshops Acts permitted, provided that all doors and frames be of iron or cased in iron plate at least ¼ in. thick, and that they be self-closing.

Protection of Structural Metal-work.

14. All columns or stanchions to be covered with brickwork or porous terra-cotta (at least 2 ins. thick), or with cement, concrete or plaster at least 1½ ins. thick, keyed into metal supports and protected by a metal guard up to a height of not less than 4 ft. from the floor where cement, concrete or plaster only used.

15. Girders, joists, lintels and all structural metal-work (other than columns and stanchions, but including framework of roofs), where not covered with brickwork, to be completely encased in porous terra-cotta at least 2 ins. thick, securely anchored, or cement concrete, or plaster at least 1 in. thick keyed into metal supports.

16. Space must be left at the ends of girders and joists to permit of expansion.

Linings and Ceilings.

17. No lining of wood or textile fabric to any part of the walls, partitions, ceilings or roof.

Floor Openings.

18. No openings through any floors allowed except as follows:—

(a) Holes to admit driving shafts, pipes and iron or earthenware tubes for electric conductors. Shafts to fit closely in metal collars, and all pipes and tubes to be cemented round the full thickness of the floor.

(b) Staircases and hoists of which the enclosures are constructed entirely of brick or cement-concrete as above described at least gins. thick, with a regulation fireproof door to every opening.

N.B.—Stairs and landings within said enclosures to be constructed of incombustible material.

N.B.—Where the building is within the City of London or in the area controlled by the London County Council hardwood doors to openings may be allowed instead of fireproof doors.

N.B.—Where the staircases and hoists extend to the top floors they must have a glass roof protected externally with strong wire-work, and the enclosing walls must be carried through and 18 ins. above the roof of the building.

In factories and workshops in the area controlled by the London County Council a glass roof protected as above is only to be provided in cases where the enclosing walls and staircases are carried through and 18 ins. above the roof of the building, and also above the roof of the adjoining premises. Otherwise the roof must comply with the requirements of the London County Council.

(c) Belting and rope races enclosed as for staircases and hoists.

Shafting through Walls.

19. Shafting where passing through walls to fit closely into wall, or have wall boxes closed with iron plates not less than ¼ in. thick, leaving no open space.

Pipes and Electric Conductors.

20. All pipes in the building, except water pipes not exceeding 1½ ins. in diameter, to be of hard metal. No wooden casing to be used for enclosing electric conductors.

Communicating Compartments.

21. Two or more compartments, each constructed in accordance with these rules, may communicate, whether

by double fireproof doors or otherwise, provided that their aggregate cubical contents do not exceed 60,000 cub. ft.

22. Two or more such compartments whose aggregate cubical contents exceed 60,000 cub. ft. can only be allowed to communicate across a fireproof compartment, built up from the basement with walls of solid brickwork, and constructed in all other respects in accordance with these rules so far as the same are applicable, and having all openings protected by fireproof doors at least 6 ft. apart.

23. Except as above no communication allowed between a compartment constructed in accordance with these rules and any other building or compartment.

II.—Standard Fire-resisting Cotton Mills, Flax Mills, Woollen Mills, and Worsted Mills.

Buildings to be deemed of Standard Fire-resisting Construction must conform to the following description.

Height and Area.

1. Height not to exceed four storeys and cellars. The ceiling of the cellar not to be more than 3 ft. above the lowest point of the land level or ground line of the site on which the building stands.

2. Superficial area of any one compartment not to exceed 25,000 sq. ft. internal measurement, excluding area of window recesses and doorways.

N.B.—The height of any compartment, excluding cellar, to be not less than 12 ft., measuring from the floor level to the highest point of the ceiling.

External, Party, and Internal Walls and Partitions.

3. Brick, terra-cotta, and/or cement-concrete composed of broken brick, burnt ballast, furnace slag, clinker or other similar hard and burnt material.

4. No external or party or division wall to be less than 13 ins. thick in any part, or if of concrete 20 ins.

N.B.—Stone used externally only as ashlar or facing, with a backing of brickwork not less than 13 ins. thick, and for dressings, sills, string-courses, and cornices, allowed.

5. All internal partitions to be of incombustible material, excepting only office enclosures of hard non-resinous wood with or without glazing.

6. If there is any building adjoining, the dividing or party-wall to extend at least 3 ft. above the roof of the fire-resisting building.

Flues.

7. All flues to be built of brickwork, no part of which towards the interior of the building is to be less than 9 ins. thick, and all furnace flues to be lined with fire-brick throughout for a distance of at least 20 ft. from the furnace. No timber or woodwork to rest in or be plugged into the brickwork of any flue.

Openings in External Walls.

8. The total area of openings in the external wall of any storey not to exceed one-half of the area of the wall (measured as to height from floor to ceiling of the storey in which the openings occur). All loop-hole or teagle doors and frames and window frames and sashes to be of iron or other hard metal.

9. Every window or other opening opening (whether directly or diagonally) and within 20 ft. of any window, skylight or glazed or other opening in any other building (whether such latter window, skylight or opening be protected or not), or overlooking (whether directly or diagonally) and within 20 ft. of the non-fireproof roof of any building to be protected by "fireproof" shutters or "fireproof" doors which are automatically self-closing in case of fire.

Floors.

10. Brick arches, terra-cotta, fireclay or concrete as above described, the floor being in no part less than 6 ins. in thickness, and carried on metal joists, girders and columns or brick walls or piers.

N.B.—Floors of wood not less than 9 ins. thick, ceiled with plaster or metal lathing, and with the floor boards laid on the bearers without intervening space, allowed.

11. Wooden flooring laid on brick arches, terra-cotta, fireclay, or concrete as above described allowed, provided there is no intervening space. Wooden fillets not exceeding 3 ins. deep permitted if laid on brick arches, terra-cotta, fireclay, or concrete as above described, the intervening spaces being filled with incombustible material.

12. Scuppers to carry off water, the opening of each of which shall not be less in area than 21 superficial inches, to be provided in the external walls to each floor at intervals of not more than 25 ft.

Roofs.

13. Roofs to be entirely of the incombustible materials as described for floors in Rule 10, except that 4 ins. be substituted for 6 ins. in thickness, but there may be erected above them light shelters or roofs constructed entirely of incombustible materials.

NOTE.—Glass not less than 1/2 in. thick in sections not exceeding 36 super. ins., set in iron or other hard metal, and wired glass or electro-copper glazing is accordance with the rules of the Fire Offices' Committee in force when such glazing is provided, shall for the purpose of this rule be deemed incombustible.

Outlets on to roofs rendered necessary to satisfy the requirements of the Factories and Workshops Act permitted, provided that all doors and frames be of iron or cased in iron-plate at least 1/2 in. thick, and that they be self-closing.

Protection of Structural Metal-works.

14. All columns or stanchions to be covered with brickwork or porous terra-cotta (at least 2 ins. thick) or with cement, concrete, or plaster at least 1 1/2 ins. thick, keyed into metal supports and protected by a metal guard up to a height of not less than 4 ft. from the floor where cement, concrete or plaster only used.

15. Girders, joists, lintels, and all structural metal-work (other than columns and stanchions, but including framework of roofs), where not covered with brickwork, to be completely encased in porous terra-cotta at least 2 ins. thick, securely anchored, or cement, concrete or plaster at least 1 in. thick, keyed into metal supports.

16. Space must be left at the ends of girders and joists to permit of expansion.

Linings and Ceilings.

17. No lining of wood or textile fabric to any part of the walls, partitions, ceilings or roof.

Floor Openings.

18. No openings through any floors allowed except holes to admit steam, gas and water pipes, and iron or earthenware tubes for electric conductors. All pipes and tubes to be cemented round the full thickness of the floor.

N.B.—All staircases, hoists, rope and strap races, and gearing towers to be external to the four walls of the building and constructed entirely of brick or cement concrete as above described at least 9 ins. thick.

Hoists must be constructed in the staircase enclosures, and no opening thereto to be less than 6 ft. from any opening into the building. Excepting hoists, the enclosing walls must be carried through and 18 ins. above the roof of the building and the roofs, stairs and landings of said enclosures must be constructed of incombustible material. No openings permitted between the building and the rope and strap races and gearing towers, and each opening from the staircase into the building to be protected by a "fireproof" door.

Shafting through Walls.

19. Shafting where passing through walls to fit closely into wall, or have wall boxes closed with iron plates not less than 1/2 in. thick, leaving no open space.

Pipes and Electric Conductors.

20. All pipes in the building, except water pipes not exceeding 1 1/2 ins. in diameter, to be of hard metal. No wooden casing to be used for enclosing electric conductors.

Communicating Compartments.

21. Two or more compartment, each constructed in accordance with these rules, may communicate whether by double "fireproof" doors or otherwise, provided that their aggregate superficial area does not exceed 25,000 sq. ft.

22. Two or more such compartments, whose aggregate superficial area exceeds 25,000 sq. ft., can only be allowed to communicate across a fireproof compartment, built up from the basement with walls of solid brickwork, and constructed in all other respects in accordance with these rules so far as the same are applicable, and having all openings protected by "fireproof" doors at least 6 ft. apart.

23. Except as above no communication allowed between a compartment constructed in accordance with these rules and any other compartment.

Rules as to Reinforced Concrete Construction.

Buildings constructed with concrete reinforced in every part with embedded metal rods or bars spaced not more than 2 ins. apart, securely connected or overlapping at least 6 ins. at all abutments and intersections, having also bands or bars across the thickness of the concrete, may be deemed of standard fire-resisting construction, provided they conform to the above rules with the following modifications:—

Rule 3.—Concrete may be composed of sand and gravel that will pass through a 1/2 in. mesh, or of the other materials mentioned in the rule, but in any case the cement used must be Portland (equal to the British Standard Specification of December 1904), in the proportion of 6 cwt. of cement to each cubic yard of concrete. The concrete must be thoroughly mixed both dry and wet, and must be rammed round the metal-work in position, every part of which must be completely enclosed with solid concrete.

Rule 4.—No external wall to be less than 6 ins. and no party wall less than 13 ins. thick in any part.

Rule 7.—Flues may be built of reinforced concrete as described not less than 4 ins. thick, if lined throughout with fireclay tubes not less than 1 1/2 ins. thick. No timber or woodwork to be in contact with such flue.

Rules 10 and 11.—Floors must be constructed of reinforced concrete as described not less than 5 ins. thick in any part without woodwork bedded therein, supported on beams and columns of similar reinforced concrete.

Rule 13.—Roofs must be constructed in a similar manner to floors, the concrete in no part to be less than 5 ins. thick.

Rules 14, 15 and 16.—All structural metal-work must be embedded in solid concrete, so that no part of any rod or bar shall be nearer the face of the concrete than double its diameter, such thickness of concrete must be in no case less than 1 in., but need not be more than 2 ins.

Rule 18.—Enclosure to staircase and hoist, if of reinforced concrete as described, may be 6 ins. in thickness.

Rule 22.—Fireproof compartments in connection with reinforced concrete structures must also be of reinforced concrete as described, with walls not less than 6 ins., and floors not less than 5 ins. in thickness.

Rules for the Application of Wired Glass and Electro-Copper Glazing for the Protection of Exposed Openings.

Wired Glass.

1. Thickness of glass not less than 1/2 in.
2. Embedded wire netting not larger than 1 in. mesh.
3. Sizes of squares of glass not to exceed 400 super. ins.
4. Sashes and/or frames: The sashes and/or frames must be entirely of iron or other hard metal securely bolted or keyed into the wall.

5. Setting of glass: The squares of glass must be set in rebates or grooves not less than 1/2 in. in width or depth, with due allowance for expansion, and must be secured by metal fastenings to sashes or frames independently of any cement or putty used for weatherproof purposes.

Electro-Copper Glazing.

1. Thickness of glass not less than 1/2 in.
2. Size of squares of glass not to exceed 16 super. ins.
3. Sectional lights: The squares of glass to be formed by electro-copper glazing into sectional lights not exceeding 4 ft. super.

4. Sashes and/or frames: Sashes and/or frames must be entirely of iron or other hard metal securely bolted or keyed into the wall.

5. Fixing of sectional lights: The sectional lights must be set in rebates or grooves not less than 1/2 in. in width or depth, with due allowance for expansion, and must be secured by hard metal fastenings independently of any cement or putty used for weatherproof purposes.

N.B.—1. No window opening exceeding 60 super. ft. or skylight exceeding 100 super. ft. will be deemed capable of efficient protection by wired glass or electro-copper glazing.

2. Hard metal casements not exceeding 8 ft. super., fitted with wired glass or electro-copper glazing in accordance with the rules and secured to the frames by hard metal hinges not more than 2 ft. apart and by fastenings, at top, centre and bottom, allowed.

Fireproof Doors.

used as a means of separation between communicating buildings and/or rooms, or between buildings and staircases.

Doors to be deemed Fireproof must be in Conformity with one or other of the following Specifications.

Iron Doors.

(a) *Construction.*—Must be made of wrought-iron plate not less than 1/2 in. thick, with styles and rails on each face of the plate not less than 3 ins. in width and 1/2 in. thick, dividing the door into panels not exceeding 2 ft. 6 ins. by 3 ft. 6 ins.

(b) *Must be hung on Hinges* or pivots in a wrought iron rebated frame bolted through, or keyed into the wall (no lead or wood may be used). Sliding doors are not allowed.

(c) *Bolts.*—Must have bolts at the top and bottom (or, if in two leaves, at the top and bottom of each leaf) fastened into the frame.

(d) *Wall Opening.*—Must have floor, jambs and head formed of brick, stone or iron, and must not be more than 5 ft. wide by 7 ft. high; when the opening exceeds 3 ft. 6 ins. in width the door must be in two leaves of equal size.

Metal-Covered Doors.

Construction.

Woodwork.—Must be made of planed, grooved and tongued well-seasoned boards, each 1/2 in. thick, crossed at right angles and thoroughly nailed together with wrought-iron nails, and the nails clinched.

Must be without panels and of the following thicknesses:—

Wall opening not exceeding 28 sq. ft., two thicknesses of boards.

Exceeding 28 sq. ft. but not exceeding 35 sq. ft., three thicknesses of boards.

Exceeding 35 sq. ft., four thicknesses of boards.

Doors for openings exceeding 28 sq. ft. may be of one thickness less than as above specified, provided that inside the tin sheets aforementioned the wood be entirely and securely covered with sheets made of a composition of asbestos and other incombustible mineral ingredients not less than 1/2 in. in thickness.

Metal Covering.—The doors must be completely encased in tinned steel or tinned iron sheets, so that no portion of the wood is exposed. The thickness of the sheets must not be less than No. 26 Standard Wire Gauge, and their size must not exceed 14 ins. by 20 ins.

All joints in the sheets must be lock-jointed and not soldered, and the width of the lock-joints must not be less than 1/2 in. The edges of the doors all round must be covered with sheets turned round at least 2 ins. on each face.

The sheets must be attached closely to the doors with screws or barbed nails which must penetrate at least three quarters of the thickness of the door, and be placed not more than 6 ins. apart. All screws and nails must be inside the lock-joint. The tinned sheets should be left bright; but if it is desired to paint the doors, then white paint only may be used.

Fittings.—All the door fittings and attachments must be of iron. All fittings must be bolted through the doors, and not screwed to them; and all wall attachments must be securely bolted through or keyed into the wall. No lead or wood may be used.

Sliding Doors must overlap at least 3 ins. at the top of the wall opening, and at the sides also unless prevented by a cross wall, in which case the doors must, when closed, come as near such wall as possible. An iron guide must be securely fixed into the wall at the bottom of the wall opening, and a stop must be fixed on the opposite side of the opening and about one-third of the way up so as to keep the door quite close against the wall when closed.

Hinged Doors must overlap at least 3 ins. at the top and sides as in the case of sliding doors, or be hung in a wrought-iron frame having not less than a 1/2 in. rebate, bolted through or keyed into the wall (no lead or wood being used for the purpose).

Wall Opening must have floor, jambs and head formed of brick, stone or iron, and must not be more than 5 ft. high, and the superficial area thereof must not exceed 45 ft.

N.B.—No opening exceeding this size to be deemed capable of efficient protection by doors.

N.B.—An opening in a party-wall having a superficial area exceeding 45 ft. can not be deemed to be efficiently protected by placing a broad band of metal in the centre of the opening and protecting the aperture on either side of the metal band with metal-covered doors, neither of which exceeds 45 super. ft.

Double Fireproof Doors.

Double fireproof doors must be constructed according to the above rules, and must be fitted one on each side of the wall-opening. Sliding doors must be distant from each other not less than the full thickness of the wall, but hinged doors may be fitted flush with the surface of the wall provided that the distance between the doors be not less than 6 ins. One iron and one metal-covered door so constructed and fitted will be deemed equivalent to double fireproof doors.

It is recommended that a sill of from 1 1/2 ins. to 3 ins. thick of hard wood be placed in the doorway to prevent the flow of water from one room to another.

Fireproof Shutters for Windows and other Openings in External Walls.

Shutters to be deemed fireproof must be in conformity with one or other of the following specifications.

NOTE.—No window or other opening exceeding 50 super. ft. will be deemed capable of efficient protection by fireproof shutters.

WARRANTY.—It must be warranted in the policy that fireproof shutters be closed at nights, on Sundays, and at all other times when the rooms are not occupied.

Iron, Steel Gauze and Metal-covered Shutters: Construction.

Iron Shutters must be of wrought-iron or steel not less than $\frac{1}{2}$ in. thick, and must have styles and rails on each face not less than 3 ins. wide and $\frac{1}{2}$ in. thick, dividing the shutter into panels not exceeding 2 ft. 6 ins. by 3 ft. 6 ins.

Steel Gauze Shutters must be of steel wire not less than $\frac{1}{2}$ in. thick and have not less than 64 meshes to the sq. in. They must be securely riveted in a double frame of angle iron at least 1 $\frac{1}{2}$ ins. by 1 in. and $\frac{1}{2}$ in. thick, dividing the shutter into panels not exceeding 3 ft. 6 ins. by 2 ft. 6 ins.

Metal-covered Shutters.

Woodwork.—Must be of at least two thicknesses of planed, grooved and tongued well-seasoned boards, each $\frac{1}{2}$ in. thick, crossed at right angles and thoroughly nailed together with wrought-iron nails, and the nails clinched. They must be without panels.

Metal Covering.—The shutters must be completely encased in tinned steel or tinned iron sheets, so that no portion of the wood is exposed. The edges of the shutters all round must be covered with sheets turned round at least 2 ins. on each face. All joints in the sheets must be lock-jointed and not soldered, and the width of the lock-joints must not be less than $\frac{1}{2}$ in.

The sheets must be attached closely to the shutters with screws or barbed nails which must penetrate at least three-fourths of the thickness of the shutter and be placed not more than 6 ins. apart. All nails or screws must be inside the lock-joint. The thickness of the sheets must not be less than No. 26 Standard Wire Gauge, and their size must not exceed 14 ins. by 20 ins.

Fittings.—All the shutter fittings and attachments must be of iron. All fittings must be bolted through the shutters and not screwed to them.

Fitting-up of Shutters as above.

Sliding Shutters must slide by means of pulleys running on wrought-iron frame. They must have iron guides securely fixed into the wall at the bottom of the opening and a stop fixed on the opposite side of the opening so as to keep the shutters quite close to the wall when closed.

Hinged Shutters—Shutters hung on hinges or pivots must have metal latches or catches, or, if in two leaves, a wrought-iron bar, to keep the shutters close to the wall when closed.

General Rules.

All shutters as above must fit closely on the outside of the window or other opening.

They must (1) overlap at least 3 ins. at the top and side of the opening unless prevented by a cross-wall, in which case the shutters must, when closed, come as near the wall as possible; or (2) close in a wrought-iron rebated frame.

Latches and bars on shutters above ground floor must be operated from both sides.

Wall attachments must be securely bolted through or keyed into the wall. No lead or wood may be used.

Revolving Iron Shutters.

Must be constructed of curvilinear laths of wrought-iron or steel of not less than No. 12 Standard Wire Gauge in thickness, fitted with 1 $\frac{1}{2}$ in. strap hinges not more than 2 ft. apart. The shutter to run in iron or steel grooves not less than 1 in. deep, bolted or keyed into the wall. No lead or wood may be used.

FIRE-RESISTING MATERIALS

Under the London Building Act (Amendment), 1905.

THERE seems to be considerable misunderstanding amongst architects as to one of the features of the London Building Act which has been under investigation during the last session. We refer to the schedule of fire-resisting materials, for this schedule has been considerably altered and, we may say, improved, although we do not favour the absence of some distinction in the Act between "fire-resisting" materials and "incombustible" materials, for in the schedule as it now stands there are again incombustible materials mentioned which are anything but fire-resisting. In this respect we would mention particularly slate, granite and terra-cotta without the modification of porous or semi-porous, for under materials that are fire-resisting should always be understood materials that will stand a high temperature of fire for a considerable period, followed immediately by the application of water under pressure. We present the new schedule herewith.

One of the most useful improvements in the schedule has been the reduction of the thickness of 2 in. hardwood to 1 $\frac{1}{2}$ in. "finished thickness," as there has always been a great deal of trouble on this point, thus allowing the architect to use 2 ins. of wood and get it planed down and properly finished off without running the risk in future of its being condemned as not being 2 ins. thick in the true sense.



WRECKAGE AT A HAMBURG WORKSHOP FIRE.

A novel feature of some importance is the clause which allows practically all wired glass and Luxfer prism glazing as a fire-resisting material, this being the outcome of protracted investigations which occupied some years, and which have now been recently satisfactorily concluded. The limitations as to size in this rule are necessary ones, and fully in accord with the recent experience.

The Schedule.

The following materials shall for the purposes of the Act of 1894, the Act of 1898 and this Act be deemed to be fire-resisting materials:—

(I) For general purposes:—

(1) Brickwork constructed of good bricks well burnt, hard and sound, properly bonded and solidly put together—

(a) With good mortar compounded of good lime and clean sharp sand, hard clean broken brick, broken flint, grit or slag; or

(b) With good cement; or

(c) With cement mixed with sharp clean sand, hard clean broken brick, broken flint, grit or slag.



THE EFFECT OF FIRE ON BRICKWORK.

(2) Granite and other stone suitable for building purposes by reason of its solidity and durability.

(3) Iron, steel and copper.

(4) Slate, tiles, brick and terra-cotta when used for coverings or corbels.

(5) Flagstones when used for floors over arches, but such flagstones not to be exposed on the underside and not supported at the ends only.

(6) Concrete composed of broken brick, tile, stone, stone chippings, ballast, pumice or coke-breeze and lime-cement or calcined gypsum.

(7) Any combination of concrete and steel or iron.

(II) For special purposes:—

(1) In the case of doors and shutters and their frames oak, teak, Jarrah, Karri or other hard timber not less than 1 $\frac{1}{2}$ ins. finished thickness, the frames being bedded solid to the walls or partitions.

(2) In the case of staircases and landings oak, teak, Jarrah, Karri or other hard timber, the treads, risers, strings and bearers being not less than 1 $\frac{1}{2}$ ins. finished thickness, and the ceilings and soffits, if any, being of plaster or cement.

(3) Oak, teak, Jarrah, Karri and other hard timber, when used for beams or posts or in combination with iron, the timber and the iron (if any) being protected by plastering or other incombustible or non-conducting external coating not less than 2 ins. in thickness, or in the case of timber not less than 1 in. in thickness on iron lathing.

(4)—(a) In the case of floors and roofs—Brick tile terra-cotta or concrete composed as described in paragraph (1), (6) of this schedule not less than 5 ins. thick in combination with iron or steel;

(b) In the case of floors and of roofs of projecting shops—

Pugging of concrete composed as described in the said paragraph (1), (6) not less than 5 ins. thick between wood joists, provided a fillet 1 in. square is secured to the sides of the joists and placed so as to be in a central position in the depth of the concrete or concrete blocks not less than 5 ins. thick laid between wood joists on fire-resisting bearers secured to the sides of joists.

(5) In the case of verandahs, balustrades, outside landings, the treads, strings and risers of outside stairs, outside steps, porticos and porches, oak, teak, Jarrah, Karri or other hard timber not less than 1 $\frac{1}{2}$ ins. finished thickness.

(6) In the case of internal partitions enclosing staircases and passages, terra-cotta, brickwork, concrete or other incombustible material not less than 3 ins. thick.

(7) In the case of glazing for windows doors and borrowed lights, lantern or skylights glass not less than $\frac{1}{4}$ in. in thickness in direct combination with metal the melting point of which is not lower than 1,800 degs. Fahr. in squares not exceeding 16 sq. ins. and in panels not exceeding 2 ft. across either way the panels to be secured with fire-resisting materials in fire-resisting frames of hardwood not less than 1 $\frac{3}{4}$ ins. finished thickness or of iron.

(III) Any other material from time to time approved by the Council as fire-resisting.

RECENT FIRE TESTS.

A Girderless Floor.

OF the recent official tests of the Fire-Prevention Committee the one with a German floor, described as being of the "Bremer" system and put forward by Messrs. Faber, of Berlin, is certainly of considerable interest, as it opens up the question of the application of porous brick in combination with metal rods on a principle not dissimilar from that of reinforced concrete. Whether the floor is practicable for English purposes and commercial use is beyond the scope of this notice, but we understand the floor is being considerably used in Germany, where cheap skilled labour is obtainable.

The principle of the floor is that hollow bricks measuring about 6 ins. square and 12 ins. in length are laid side by side, with intervening spaces of about 1 in., and in these intervening spaces rods are placed and the whole then grouted in with cement to form a solid floor.

A floor of this description measuring 22 ft. by 10 ft. in one span was under fire test for a period of 2 $\frac{1}{2}$ hours, followed by the application of water for 2 minutes, the floor being loaded 2 cwt. to the foot.

The summary of this test is as follows, and shows that although there was considerable deflection, namely 3 ins., neither fire nor water got through the floor.

Summary of Effect.

In one minute after the gas was lighted the plaster began to fall, and continued to do so till the end of the test.

On the application of water the plaster to the soffit was washed off where struck by the jet, and some of the longitudinal joints were washed out, exposing the iron rods.

The floor remained in position.

The maximum deflection of the floor was 3 ins.

Neither fire nor water passed through the floor.

On the removal of the load the upper surface of the floor showed one longitudinal and nine transverse cracks and four diagonal cracks at the corners.

THE FIRE-RESISTANCE OF CONCRETE.

WITH the advent of reinforced concrete and its increasing popularity the question of its fire-resistance, as well as that of the fire-resistance of ordinary concrete is being more closely considered than heretofore, and this consideration is certainly very necessary seeing how this matter has been previously neglected.

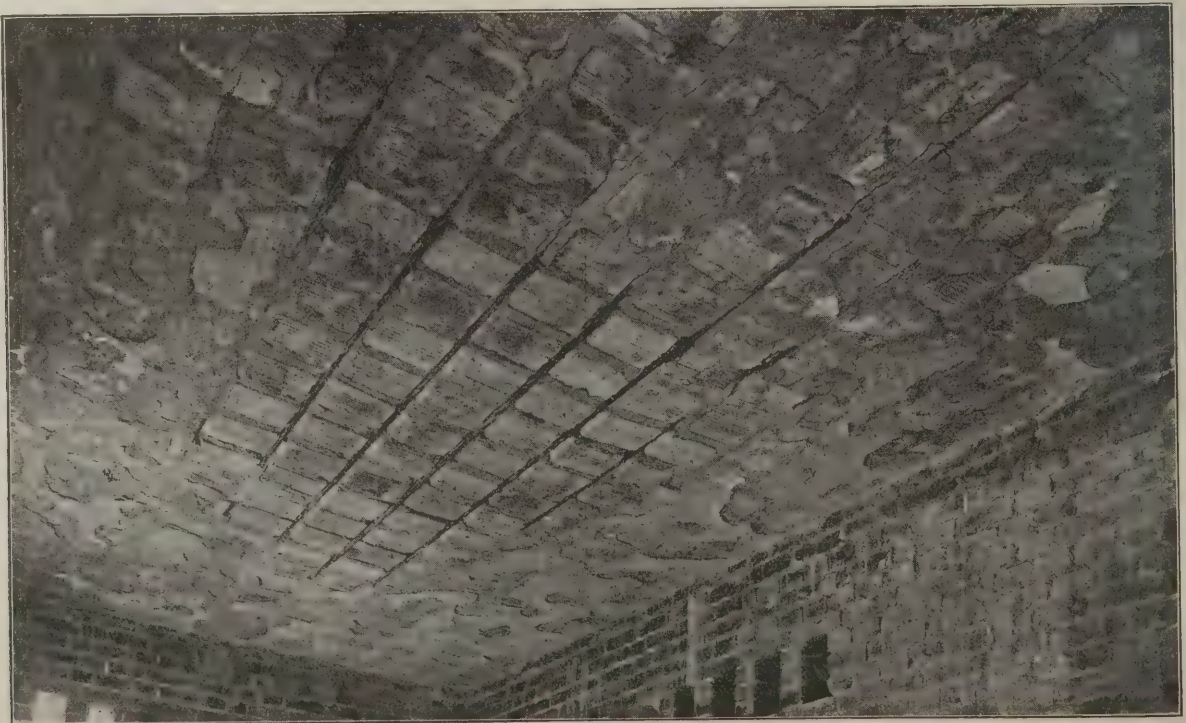
As a rule the architect will generalize and speak of "cement concrete," giving little heed to whether the requirements of the building necessitate coke-breeze concrete, slag concrete, Thames ballast concrete or otherwise. Similarly, if the architect specifies a ferro-concrete floor, he appears to specify it in general terms or to the specification of some specialist contractor, and again gives little heed to what aggregate would be most serviceable to the requirements he has to meet.

In broad terms, cement concrete is generally described as fire-resisting, and reinforced concrete is similarly described. As a matter of fact, nothing is more dangerous to the safety of a building than reinforced concrete where the metalwork is not suitably protected against the impingement of flame, and where the aggregate has not been selected so as to prevent its flaking off or disintegrating on the application of heat and water. For ordinary concrete work the question of aggregate is likewise of the utmost importance as far as fire-resistance is concerned.

Of the concrete floors in this country that have been tested and found satisfactory, the floor constructed on the Columbian fire-proofing system occupies a front place. This system of fire-resisting floor construction is for all practical purposes a reinforced cement concrete one, the bars being carefully protected from the impingement of flame. In this system a suitable concrete aggregate has been used from the very outset of its introduction in this country. Expanded metal is also another system of reinforcing concrete which is highly esteemed. On the other hand, a Swiss reinforced cement-concrete floor that was put forward for independent investigation failed lamentably, as illustrated in one of our earlier supplements, the reason being that both an unsuitable concrete aggregate was used as also insufficient protection accorded to the bars, which were placed too close to the soffit.

As we go to press the most extensive investigations that have so far been undertaken anywhere upon this question will be in operation at the British Fire Prevention Committee's testing station, where, on the one hand, the Committee, in conjunction with the Associated Portland Cement Manufacturers, Ltd., are undertaking a test with seven variations of concrete aggregates as applied to floor bays, whilst, on the other hand, Messrs. Coignet, of Paris, have put forward a large floor measuring 15 ft. by 22 ft. in order to have the fire-resistance of their ferro-concrete system tested. As to the last-named investigation, it is of course too early to speak until the test has actually taken place, nor are details of the construction of the floor in question yet available, but as to the test with the concrete aggregates in general use we have some further particulars to hand beyond those we have already published giving exact data of what the concrete aggregates comprise, and as this is of general importance we think it is advisable at this juncture to present some particulars as to the construction of the floor in which these seven concrete varieties come under investigation.

If these investigations teach nothing else, they should serve as a warning against the promiscuous use of concrete aggregates that do not lend themselves to fire-resistance.



A REINFORCED POROUS CLAY TUBE FLOOR: VIEW AFTER TEST (FROM BELOW) LOOKING SOUTH.

The construction of the concrete floor may be described as follows:—

The floor was divided into seven separate bays, each bay being in the clear 10ft. long by 2ft. 7ins. wide between the casing of the girders.

There were six girders of 6ins. by 4½ins., weighing 20 lbs. per ft. lineal, the ends being built into the side walls of the hut. Each girder was encased with coke-breeze concrete 8½ins. wide by 10½ins. deep, so as to give a minimum of 2ins. concrete all round the girder.

The bays or slabs of concrete were 5ins. thick, and were quite separate, resting on a 4½in. set-off all round the hut and on the concrete casing to the girders.

The cement used was Portland cement supplied by the Associated Portland Cement Manufacturers, Ltd., London, and described by them as "Ferrocrete," used as a trade name for this particular brand of cement.

The following is a description of the aggregates, giving the amount of aggregate to 1 part by measure of cement in each case:—

(1) *Furnace Slag Concrete.*—Blast furnace slag from the Isip Ironworks, Thrapston, Northampton, broken to pass a 1½in. ring, 3 parts. Clean pit sand from Kent, 2 parts.

(2) *Broken Brick Concrete.*—Broken brick to pass a 1½in. ring, 3 parts. Clean pit sand from Kent, 2 parts.

(3) *Broken Granite Concrete.*—Broken granite, ½in. Guernsey granite chips, 3 parts. Clean pit sand from Kent, 2 parts.

(4) *Burnt Ballast Concrete.*—Burnt ballast, viz., clay from the neighbourhood of Child's Hill, burnt with slack coal, broken to pass a 1½in. ring, 5 parts.

(5) *Coke Breeze Concrete.*—Coke-breeze broken to pass a 1½in. ring (free from fine dust), from the retorts of a London gas company, 5 parts.

(6) *Clinker Concrete.*—Furnace clinker, viz., the raking from the furnaces of large boilers, broken as last, 3 parts. Clean pit sand from Kent, 2 parts.

(7) *Thames Ballast Concrete.*—Thames ballast dredged from the river Thames to pass a 1½in. ring, 3 parts. Clean pit sand from Kent, 2 parts.

In each case the material was turned both in its dry and wet condition, and the concrete to form each slab laid on the centering in a rather wet state, six pails of water being used for each bay, slips of wood being fixed at the sides to retain the concrete in its place and form the necessary spaces.

A FRANKFORT FIRE-STATION.

ALTHOUGH the advent of the motor fire-engine will entirely revolutionize the planning of a modern fire-station, the advent of the motor appliances, as far as Great Britain is concerned, is not likely to be as rapid as in some Continental cities where practically the whole of a city's fire service can, with one stroke of the pen, be transformed into a motor service. The horse is still very much with us, and is still likely to be for a considerable period, and this question of the horse in relation to the horse-drawn fire appliance is one that must yet be constantly before the designers of fire-stations.

Of late there has been a tendency both at home and abroad to break with the tradition of the stable being placed at the back of the engine-room, the door opening and the horse running forward to its place in front of the engine. There has been a tendency to put the horse alongside or slightly in front of the appliance, i.e., to stable the horse in the engine-house.

The latest variation of this principle comes from Frankfort, where the horse is not stabled actually in the engine-house, but instead of being stabled at the back of the engine-house is in front of it, and doors separate the stabling from the engine-house proper.

We therefore give views of the stable and the station generally, and in doing so we would mention that this Frankfort fire-station was designed by the Municipal building department of that town.



NEW FIRE-STATION AT FRANKFORT.

FLAME-PROOF WOOD.

THE remarkable prejudice which has been shown in London against flame-proof wood, more generally known as "non-inflammable" wood, is so extraordinary and so regrettable that we are afraid that when the professional man of the next decade looks back upon the doings of his colleagues at the turn of the nineteenth and twentieth centuries he will be amazed at the short-sighted policy now prevalent.

Our prejudice is, however, shared by our Continental neighbours, so that we are in company and not as isolated as usual in our conservatism. The United States alone have proved the value of having flame-proof wood if it is properly prepared and applied in a business-like manner, and legislation rightly requires its use in the large cities of the United States for buildings of exceptional

fire risk such as tall office buildings and the like.

It has been found in practice that although flame-proof wood is necessarily very much more expensive wood than untreated deal or pine (taking cubic foot by cubic foot), its relatively higher cost is but fractional the moment the labour bill is added, and we can safely say the untreated joinery is but little cheaper than flame-proof joinery, whilst the percentage of additional cost on the total outlay of a building where flame-proof wood is used is infinitesimal.

One of the difficulties in the introduction of flame-proof wood in America was that of obtaining reliable material and getting it applied in a business-like way. It is this difficulty which has probably hampered its introduction into this country, and for this reason it is well to present from the pen of Professor Woolson some particulars as to the



FIRE-STATION STABLES AT FRANKFORT.

methods adopted in New York City in obtaining reliable non-inflammable wood in ordinary building practice. The particulars are the more interesting at the present moment, when we are expecting a new Building Act Amendment Bill for 1906 based on the overmatter of the Bill for 1905, which, whilst dealing with every conceivable form of improvement in building construction from the fire point of view, somehow kept quite clear of any mention of the existence of such a thing as flame-proof or non-inflammable wood, or, as a matter of fact, of even the existence of non-inflammable textiles, which should certainly be compulsory for certain classes of property.

In the schedule of fire-resisting materials, as altered by the Act of 1905 just passed on matters relating to escape from fire, no account has been taken of the fact that properly chemically treated deal or other soft wood is quite as fire-resisting as untreated hardwood, if not more so. Even the British Fire Prevention Committee in its suggestions for improving the London Building Act, which suggestions have been published from time to time, does not appear ever to have made mention of flame-proof wood or to have tackled this subject of non-inflammability. This is the more surprising as flame-proof wood has been under investigation under the auspices of the Committee, and has during the severe ordeals made a very excellent showing. It would indeed be well if the problem were taken up, for even if those who are prejudiced against the material, or say, on account of ignorance of its durability, may argue that it should not be applied in permanent structures, there is not the slightest doubt that it should be used in all temporary buildings and that it should certainly be used throughout the theatre stages of the Metropolis. Granted that permanency has not yet been proved by half a century of constant use—although ten years' experience supplemented by chemical knowledge should be sufficient proof for all practical purposes—there can be no doubt whatever as to its efficiency and durability for all temporary work where as a matter of fact treated wood is very much wanted.

THE CONTROL OF ITS USE IN THE UNITED STATES.

By Professor Woolson.

Regarding the question of obtaining reliable flame-proof wood, the present method of testing as adopted in New York City is described by Professor Woolson as follows:—

When a shipment of lumber is prepared an inspector proceeds to the works and selects at random one sample from every 2,000 ft. of material. This is sent to the laboratory and tested, reports being sent to the Building Bureau and the manufacturer. Two tests are applied to each sample: one a "shavings test," which is a test used by the U.S. Navy, and the other a test devised by the writer, which for want of a better name is called a "timber test."

The shavings test, while useful in a general way to determine the flaming properties of treated wood, is nevertheless unsatisfactory. We are now making series of different tests in an endeavour to supplant it with something more reliable. The test is conducted as follows:—A pan 1 ft. in diameter and 6 ins. deep is mounted on legs. The bottom is formed by a heavy wire screen of $\frac{1}{2}$ in. mesh. This wire bottom is covered with a layer of shavings 2 ins. deep, and a Bunsen burner is applied underneath for twenty-five seconds; then the burner is removed, and the lengths of time during which the shavings support (1) flame and (2) glow are recorded, and also the area of shavings burned.

The idea of this test is that shavings from properly-treated wood will not support flame

any considerable time, and that the flame will gradually die out without material enlargement of the burned area. After test the remaining shavings are thrown away. There are no means for making a permanent exhibit of the results, except by photographs, which would be difficult to take and quite unsatisfactory. The wood must be accepted or rejected on the judgment of the operator, based upon notes taken while observing the test.

Besides these obvious disadvantages, there are two other strong objections to the shavings test—first, the extreme difficulty of always maintaining the same conditions of flame and heat under the shavings; and, second, the impossibility of securing a uniform quality of shavings for tests. The Navy specifications call for the use of the Bunsen burner with a flame giving about 500 degs. C. = 932 degs. Fahr. Now, Bunsen burners vary considerably in the size of flame they produce, so, although every precaution was taken and the same standard temperatures were determined in each of two flames at some definite point, the results of tests upon the same kind of shavings might show widely different figures, because of the general variation in the character of the flames. Much depends also upon how and where the tests are conducted; whether under a smoke hood with a strong draught, or in an open room where air-currents could strike the flame and cause it to sway. The most serious objection, however, to the shavings test, and the one which is fatal to its use as a standard method of comparison, is the impossibility of making the shavings of uniform size and quality.

Shavings made by the same carpenter and as nearly alike as possible are some as fine as sawdust, while others are very coarse with all gradations of size between. Another objection is that in coarse-grained wood like oak the plane in making the shaving splits many of the large pores and allows the crystallized chemical to fall out, thus removing a part of the fire-resisting agent. Lastly, no wood in the form of shavings would be exposed to fire in a building. It would seem that further evidence is unnecessary to demonstrate the inappropriateness of this test alone as a standard of comparison.

To avoid the difficulties of this and similar tests the previously mentioned "timber test" was designed. Though not entirely satisfactory, the results as a whole have been gratifying. During the past two years the writer has conducted over 4,000 tests upon fireproofed wood, the majority being "timber tests." Scarcely any criticism of the method of test has been offered by clients, though the results were often not gratifying.

The specimens for this test are accurately cut to a size $1\frac{1}{2}$ ins. by $\frac{3}{4}$ in. by 12 ins. These "timbers" are tested in pairs by being laid across the top of a 6 in. gas crucible furnace in which a constant temperature of 926 degs. C. = 1,700 degs. F. is maintained. This particular temperature was chosen because it is given by the New York Building Code as approximately the heat of a burning building. At the end of two minutes the specimens are removed and duration of (1) flame and (2) glow noted for each.

The temperature is under constant control by means of a Le Chatelier pyrometer, the "couple" being placed between the two specimens, thus recording the heat exactly at the point of application. The proportions of gas and air are regulated to furnish a vigorous flame 8 ins. to 10 ins. above the furnace, so imitating an ordinary fire.

After test the specimens are sawn in two at the middle and tracings made of the unburned wood. These tracings are then carefully measured by planimeter and the percentage ratios to the original cross-section calculated. The percentage of unburned

wood is printed upon the tracing of each specimen, and then blue prints are made which become a part of the permanent record.

However, the value of the "fireproofed" wood cannot be rated by this feature alone. Account must be taken of the tendency to ignite and support combustion. This is indicated by duration of flame and glow after the specimen is removed from the fire. In every instance the contrast in time of flame and time of glow between the treated and the untreated wood is very marked. The average duration of each taken from 688 tests on four varieties of treated soft woods was 7 secs. and 12 secs. The same data taken from 846 tests on four varieties of treated hardwoods was 10 secs. and 14 secs.

Similar calculations based upon tests of untreated wood, though not averaged from nearly so many tests, gave for soft woods, flame, 1 min. 19 secs.; glow, 1 min. 53 secs.; and for hardwoods, flame, 2 mins. 31 secs.; glow, 6 mins. 29 secs.

Those figures give a ratio of 1 to 11 and 1 to 9 for flame and glow between treated and untreated soft woods, also 1 to 14 and 1 to 27 for hardwoods. That is, the tendency of untreated woods to burn is 10 to 20 times that of treated woods. This measure of the property of retarded combustion is as important as the determination of the percentage of unburned areas, for in the first stages of a fire minutes are valuable. Experience has shown that a variation of 5 per cent. should be allowed in cross-section area, because of structural differences in the wood, fluctuation in temperature, and personal error in measuring. In fact, like all investigative work, it is never safe to estimate average values from the results of a few tests.

The advantages of this method of test are (1) a test piece of uniform size, large enough for practical comparisons and small enough for numerous tests to be made with slight waste of material, thus ensuring a fair average report; (2) a constant temperature and uniform time of application of heat; (3) an estimate of the tendency to support combustion as indicated by the times of flame and glow; (4) the ability to accurately measure the amount of burn and make a drawing of same for permanent record—the specimen itself can also be easily preserved for future reference if desired. In brief, every element of the test is practically constant, except the character of the wood and the treatment it has received. Necessarily these must always remain variable.

The lumber is thoroughly dried before testing, and care exercised to keep everything uniform.

The specimens are placed so that the side which was originally the outside surface of the board faces the fire. This is necessary because the Building Bureau permits rim. outside treatment on floor sleepers and other large materials, which is encased in concrete or a coating of other fireproofed wood.

It will be noted that hardwoods, like long leaf yellow pine, oak and maple, when treated, differ only slightly in unburned area from untreated lumber.

They are naturally "slow-burning" material. It would scarcely be necessary to fireproof hardwood if the preservation of structural strength were the only consideration. But the danger from inflammability should make a surface treatment imperative. Soft woods which waste rapidly under flame should be treated throughout.

Theatre Safety.—The Austrian authorities are conducting a series of experiments regarding the safety of theatres, and a report on the subject will be shortly issued.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

November 1, 1905. Vol. 22, No. 560.

6, Great New Street, Fetter Lane, E.C.

Summary.

Competitions are far too often hushed up, the promoters regarding the profession as a lamb to be fleeced. Assessors also come to illogical decisions and make unfair awards. It is not impossible to find remedies for this unsatisfactory state of affairs. (This page.)

Attention is drawn in the Green Book of the Birmingham Architectural Association to the election to Fellowship, R.I.B.A., without candidates having passed the qualifying examination. "By its own regulations the Institute is required to consult the local societies with regard to such applicants within their respective provinces, but these regulations have been practically disregarded, and, what is worse, the recommendations of the local societies have been ignored when the attention of the R.I.B.A. council had been drawn to the point at issue." (Page 251.)

A large town is in course of construction in the vicinity of Clydebank, the well-known building contracting firm of Messrs. M'Alpine & Son having erected a large number of tenements to house Messrs. Singer's employees. (Page 253.)

Mr. Munro-Ferguson has been building wooden cottages on his highland estates—one type, for gillies, costing £120 inclusive, and the other, for foresters, costing £135. In County Dublin a number of cottages have been erected for the Rathdown Rural District Council at a cost varying from £145 to £170, and others for the Omagh District Council at a cost varying from £110 to £150. (Page 249.)

The most important new scheme brought forward in Manchester for many years is that presented to the City Council by a special committee appointed in 1902. This is the rebuilding of about 25 acres between Oldham Street, Victoria Street, Market Street and Cannon Street, and the provision of a new road parallel with Market Street, which is to relieve that crowded thoroughfare. (Page 254.)

The number of students at the important school of arts and crafts established by Mr. Ashbee at Campden, in Gloucestershire, has quadrupled during the past three sessions, the total number being now 205. (Page 258.)

The Wall Paper Manufacturers, Ltd., have had another successful year, and will continue to pay 8 per cent. on their ordinary shares. (Page 253.)

The Glasgow Institute of Architects hardly see their way to side with the master-masons in protesting against the use of terra-cotta instead of stone for the Royal Infirmary reconstruction, but they consider it advisable that the stone should be used on the frontage to Cathedral Square. (Page 258.)

Fraudulent Competitions.

It is time that the evils of competitions, now continually with us, were eradicated. Everyone must be heartily tired of the wrangles over one competition and another that go on in the architectural profession. Every petty little church committee or small rural council seem possessed with the idea that they can get designs on the cheap by promoting a competition. Having secured designs to look at, they hand the work over to some local acquaintance and ask him to amend his design in conformity with ideas that have been obtained from the plans submitted. They seem to regard the architectural profession as a lamb to be fleeced. Everything is done in a hole-and-corner way. A small advertisement appears in the press; very often no assessor is appointed; an exhibition of the designs is seldom held (or, if it is, the competitors and press are not informed of the date of it); and no public announcement of the decision is made. As competitors are a divided body, the malpractices of the promoters are hardly ever brought to light. The press is the only channel of communication for competitors to take any decisive action, and the press is advisedly kept ignorant. We for one, however, mean to do our best to stop this. We invite the co-operation of all competitors to furnish us with information. We are making special efforts to obtain it ourselves, and we mean to run these offenders to earth. The self-deception of certain members of the public in regard to the promotion of competitions for architectural work is remarkable. We cannot understand how church committees can thief ideas and yet satisfy their consciences. Perhaps they follow the model of Uriah Heep, thinking that the architectural profession deserves any degradation it may receive at their hands for being so foolish as to be caught with chimerical bait. The Competition Reform Society was appointed to effect some alteration in the present system, and it endeavours to obtain information and to warn competitors where no professional assessors are appointed and where no guarantees are given. This body has done much, but there are many small competitions in which a few architects are invited to submit designs, and not being open, little can be done in the way of protest against unfair conditions. It is apparent that if anybody asks for designs from the public they must take some responsibility. We say nothing of the great amount of fruitless labour that they may

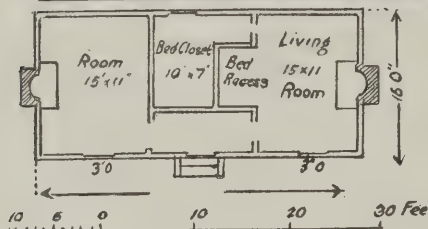
entail upon a certain section of the profession, because competitors knowingly take the risk and competitions are not essentially bad, because they help to discover talent and serve as a training ground where the novice can measure his strength against men of position and experience; but it is only common honesty that the promoters should give a fair award and take care to see that the assessor is a man of experience, so as to give satisfaction; then to furnish the public, through the press, with every information so as to prevent abuses; to hold a public exhibition; and finally to return all designs to their authors without undue delay.

Faulty Assessing.

THERE is another matter, however, apart from the promoters, which has attracted our attention recently. It is the illogical decisions of assessors well-known in the profession as men of eminence and experience, whom it is surprising to see giving unfair awards. They should stand by the conditions of the competition to the very letter. Very often, however, one finds that the winning design does not conform to the most important condition, namely, cost. Judgment should always be primarily based upon the planning. Elevations are to a great extent matters of taste, but many assessors will sacrifice convenience in planning and economy to a pleasing elevation. Then again the assessors have friends, and while on the one hand we sometimes find them favour the design of some intimate acquaintance undeservedly because of their natural appreciation of his efforts beyond those whom they do not know; on the other hand, they may fear what would be said by the profession and debar this particular competitor from the award. It would be best if the assessor's name were published in connection with the competition from the start, and his friends could refrain from entering if they chose to do so. But of course this is hardly a solution of the difficulty, and we think that the Institute might draw up some list of assessors for certain classes of work, preferably architects who were not in practice, who would thus feel themselves more in the position of judges (such as on the Tribunal of Appeal under the London Building Act or the London Chamber of Arbitration) and would take care to hold themselves aloof from anything which might suggest favouritism. Perhaps the best way out of this difficulty would be to have two, or preferably three, assessors to each competition.



GILLIE'S COTTAGE IN THE HIGHLANDS,
COSTING £120.



CHEAP COTTAGES.

Scotch, Irish and English Examples.

SO much interest has been taken in the matter of cheap cottages that we have gathered together in the present article some examples from Scotland and Ireland, together with photographs of cottages at Letchworth not hitherto illustrated in our columns.

The timber cottages in the Highlands are of the bungalow type, and contain in the one case two bedrooms and in the other three rooms which might serve as bedrooms. In the first, however, there is a recess in the living-room which could be used for a bed.

The Irish cottages, it will be noted, belong to a somewhat different type of plan to most of those at the Letchworth exhibition, although there were a few which adopted the bedroom on the ground floor. Mr. Clough's cottage, the winner of the prize for the "cheapest cottage in the exhibition," adopts this same means of overcoming the difficulty of more space being required for bedrooms than on the ground floor, when only living-room, scullery and offices are provided; but the relegation of these offices to a back addition, as in the Irish cottages, is not so cheap as the square form of plan.

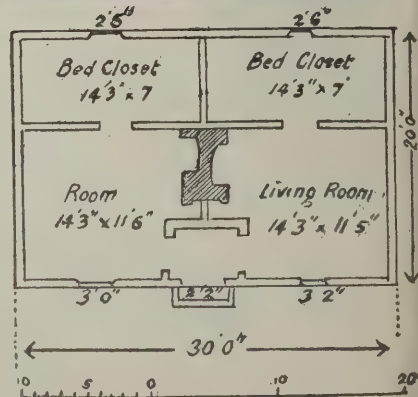
We illustrate on p. 251 Mr. Allen Foxley's cottage at the Garden City as a workman-like design, although the roof is too much cut about to be economical and a simpler roof would have been much better. The cost of this cottage under the exhibition conditions was slightly less than the £220 allowed in Class 4, and Messrs. Bowman & Sons, the builders, have offered to duplicate it in pairs at a town on the coast of Kent at £260 each. The work was done without contract.

A solution of the difficulty of providing for the very poorest is offered by Messrs. Henman & Cooper. Their cottages at Letchworth have only quite recently been completed. We give a photograph and plan of

the single cottage on p. 251. In this the bedrooms, if they can be so called, are extremely small, and it does not seem to us that the solution is a particularly satisfactory one. The cottages by Mr. Crickmer (see



p. 250) are of different types; that having a living-room, scullery and two bedrooms seems to us to be a much better plan than Messrs. Henman & Cooper's. The cost of £100 was exceeded by Messrs. Henman & Cooper, though it is difficult to see why this could not be lowered if several were erected, but we certainly think such a plan as that of Mr. Crickmer could be erected within that sum. It is apparent that a cottage with one floor such as provided by Messrs. Henman & Cooper is not an economical form, as the roof is double the area that would be needed with two floors giving the same accommodation; while the fact that it is not an exact square, but has an addition containing the sink, w.c., &c., means that the walls are greater than would be required by a square plan to enclose the same area.

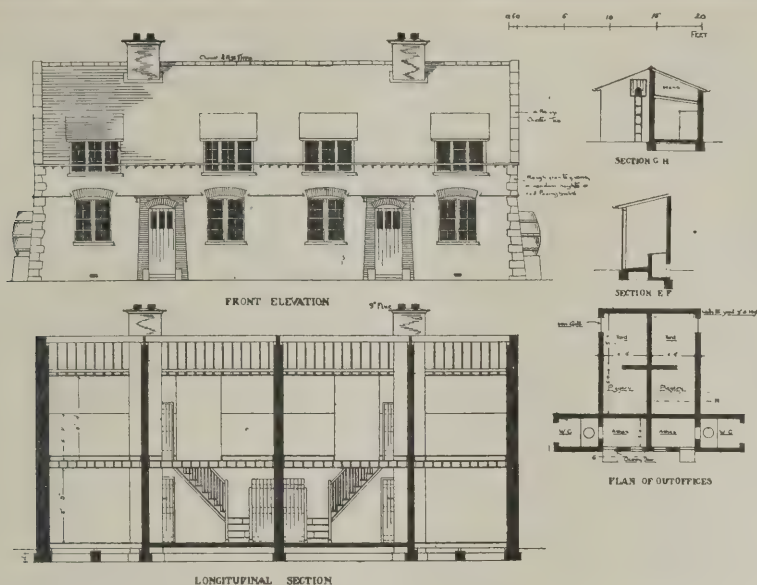


FORESTER'S COTTAGE IN THE HIGHLANDS
COSTING £135.

The fact that the cost of the four cottages is given by Mr. Crickmer at a lump sum of £600 (the builder's estimate) does not enable us to compute the cost of each type of cottage therein included. We have already referred to the type with two bedrooms. It will be seen that another contains four bedrooms, which is rather beyond what is asked for £150. The other two cottages in the group contain three bedrooms. One of the features of this plan is the fact that the earth-closets are reached under cover, but it will be noticed in this connection that the staircases from the bedroom floors are in such a position that one needs to pass through the living-rooms, which is undesirable. In the two-bedroom plan, however, this is not so.

Mr. A. H. Clough's prize cottage (p. 252) is commendable. Our readers will recall the remarks by the judges respecting the weatherboarding. Their suggestion was that this was a mistake, and that tiles would be as cheap. It will be noticed in the working drawings which have been kindly furnished us by Mr. Clough Williams-Ellis that the design has been amended in regard to this.

The roof section of Mr. Clough's cottage on p. 253 is that which has been adopted for a number of his cheap cottages in Sussex and elsewhere; it is the same also as used in the double cottage at Letchworth illustrated on p. 58 of our issue for August 2nd last, though not precisely for the single cottage shown on p. 252 of the present issue. It is interesting to note that this very section was refused three times by the Abingdon Rural District Council when submitted for a home for feeble-minded to be erected near Oxford (the architect for which was Mr. Williams-Ellis), on the ground that the lower member of the Mansard was a wall and should be built of brick.



PHOTOGRAPH OF A SINGLE COTTAGE.

The trustees for whom the home was to be built did not care to fight the matter, and therefore decided to alter the plans and build worse rooms at greater expense.

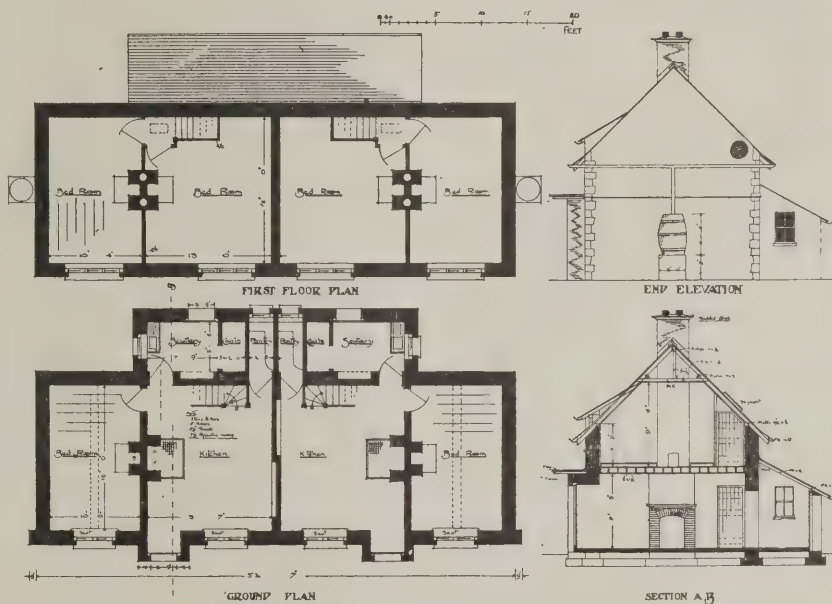
Wooden Cottages in the Highlands.

In providing cottages for his estate employees in the Highlands a new departure has been taken by Mr. Munro-Ferguson, M.P. for Leith Burghs. He owns two landed estates—one at Novar in Ross-shire and the other at Raith in Fifeshire. Hitherto stone has been used for cottages on Scottish lands. In most districts there is a quarry which, although not workable at a profit, is good enough for estate needs. Mr. Ferguson, however, is an enthusiastic aborigiculturist, and has a large acreage of excellent timber on his Highland property, and he has decided to build his cottages of this timber. So far two types of cottages are tenanted. The plainer design is for gillies, or keepers, and the better-looking cottage for the forester. The photographs on the opposite page show what they are like; the accommodation is shown by the sketch plans. Outwardly they are not particularly attractive, and as yet it is impossible to say how they will answer. The timber is creosoted, 1 gallon of oil being forced into each cubic foot of timber. The foundations are of concrete 15 ins. thick, special care being taken to exclude damp. The back and front walls are 7 ft. high and the ceilings give 9 ft. headroom. The smaller type of cottage has two good-sized rooms, one containing a bed recess, and there is a light bed-closet. The price of this cottage is stated to have been £120, including everything, while the cost of the forester's cottage is put at £135, the latter being not only more commodious but having a roof of galvanized iron. In the gillie's cottage both the roof and the walls are of timber. The forester's cottage has two large rooms and two light bed-closets. The single chimney serves both rooms.

Irish Cottages at £145 to £170.

On this page are given elevations, plans and sections of a pair of labourers' cottages, numbers of which have been erected in the Rathdown rural district (South County Dublin) under the direction of the architects, Messrs. Doolin, Butler & Donnelly, of 12, Dawson Street, Dublin.

Building in and around Dublin is dearer than in most provincial districts in England. These cottages have been completed at a cost varying from £145 to £170, according to the locality and convenience to a railway station. They are nearly all built of local granite rubble masonry walls, cement rendered, and then pebble-dashed in mortar outside. The inside walls and ceilings are plastered throughout. The roofs are covered



COTTAGES ERECTED FOR THE RATHDOWN URBAN DISTRICT COUNCIL (CO. DUBLIN).
DOOLIN BUTLER AND DONNELLY, ARCHITECTS.

with thick, heavy, rough Irish slates. The chimneys are of red facing bricks built with a batter. The accommodation consists of a kitchen 16 ft. by 12 ft., principal bedroom 12 ft. by 11 ft. 6 ins., small scullery, pantry and fuel store. Upstairs there are two attic bedrooms, 12 ft. by 16 ft. and 16 ft. by 11 ft. 6 ins. respectively, the height to wall-plate being 4 ft. 6 ins. In a few cases these houses have been built of concrete at a slightly less cost, but, generally speaking, the architects prefer the granite whenever they can get it, as they find it makes a warmer house.

They have built about eighty-six of these houses for the Rathdown Rural District Council under the Irish Labourers' Acts, and have in hand a further scheme for seventy-five. Messrs. Doolin, Butler & Donnelly have built a number of houses somewhat smaller for the Omagh District Council at a cost ranging from £110 to £150, and similar houses have been built in large numbers by other architects in every part of Ireland. Messrs. Doolin, Butler & Donnelly say they are convinced that there is no necessity to have recourse to cheap and temporary materials. "Our experience leads us to feel that the way in which economy may best be effected is by extreme simplicity of plan, and

that as a rule too much of the accommodation in English labourers' cottages is lost in sculleries, pantries and similar offices, desirable as these may be when the strictest economy is not essential."

With each of the Rathdown cottages there is given a plot varying from one rood to a statute acre in extent, according to the requirements of the labourers of the locality and the spare time at their disposal for tilling it. Of course in a few cases where the land is valuable a rood or even half a rood only is given.

Included in the contract are also small out-offices, comprising a piggery, hen-house, asphalt and sanitary accommodation, built of masonry or concrete and floored in concrete. The fencing of the sites is, not included in the contract. Iron fencing is generally used, at a cost of about 3s. per yd. lin. In Omagh district the architects use a sod fence consisting of bank and ditch, with "quicks" planted on the side of the former. The cost of such a fence is about 2s. per lineal Irish perch. The rents, inclusive of land, vary from 1s. 6d. to 2s. per week. The capital outlay on the scheme is obtained on loan from the Treasury and repayable in thirty-five years. There is of course a deficit, which is met out of the rates.

Materials used in Mr. Clough's Prize Cottage (No. 71) at Letchworth.

Concrete.			£ s. d.		
6½ yds. gravel	-	5s. 4d.	1	14	8
9 bags cement	-	2s. 7d.	1	3	3
			£ 2 17 11		
Brickwork, &c.			£ s. d.		
12,000 bricks	-	23s.	13	16	0
12 rolls 4½in. D.P.C. felt	-	9d.	0	9	0
½ " " " "	-	11d.	0	0	5½
5 air bricks (iron)	-	2½d.	0	0	11½
100 9 by 9 quarries	-	-	0	14	0
4 chimney pots	-	1s.	0	4	0
11 yds. sand	-	3s. 5d.	1	17	7
2½ yds. lime	-	11s. 3d.	1	5	3½
2 bags cement	-	2s. 7d.	0	5	2
½ cwt. wall ties (galvanized)	-	18s. 6d.	0	4	7½
1 chimney bar	-	-	0	2	0
620 No. 9 Colthurst tiles	-	-	5	7	3
1,750 plain Yorkshire tiles	-	-	2	14	4
100 " " tiles and half	-	-	5	8	2½
200 " " eaves	-	-	0	6	2½
60 half-round ridge and hip	-	1d.	0	5	0
			£ 27 17 8½		

Carpenter and Joiner.			£ s. d.		
125ft. cube 4in. by zin. carcasing	-	1s. 1½d.	7	3	2½
1 E.C. seat and rise (facia board in flooring)	-	-	0	2	6
4½ rolls roofing felt	-	4s.	0	18	0
1 6ft. 8in. by 2ft. 8in. front door	-	-	0	8	0
1 6ft. 6in. by 2ft. 6in. back door	-	-	0	3	6
1 6t. 6in. by 2ft. 6in. shed door	-	-	0	3	0
3 four-panel doors	-	5s.	0	15	0
1 7ft. by 3ft. 8in.	-	-	-	-	-
3 5ft. 4in. by 3ft. 8in.	-	1s.	5	3	0
1 1ft. 8in. by 2ft. 4in.	-	-	-	-	-
2 2ft. by 3ft. 8in.	-	-	-	-	-
1 front-door frame	-	-	0	6	0
1 back " "	-	-	0	5	0
1 shed " "	-	-	0	4	6
6½ squares rin. red flooring	-	12s.	3	18	0
44ft. cube joists and curb	-	1s. 4d.	2	18	8
1,500ft. run zin. by rin. tile batten	-	9d.	0	11	3
180ft. run zin. by zin. arch lining	-	2s.	0	3	8
2½ squares zin. flooring for skirting, &c.	-	8s.	0	18	0
700ft. run zin. by zin. tile battens	-	11d.	0	6	5
2½ squares rin. double-sided match-boarding	-	13s. 9d.	1	14	4½
22 bundles plasterer's laths	-	11d.	1	0	2
½ square zin. matching	-	7s.	0	5	3
50ft. run zin. by rin. stair treads and window bonds	-	1½d.	0	6	3
70ft. run zin. by zin. stair risers and window linings	-	1½d.	0	7	3½
25ft. run zin. by zin. stair strings	-	2½d.	0	5	5
60ft. run zin. by zin. door stop	-	-	0	0	9½
½ square zin. matching	-	10s.	0	2	6
22ft. run cornice moulding	-	2d.	0	3	8
			£ 28 13 5½		

* Window frames, including glass, 103ft. super.

Plasterer.			£ s. d.		
21 lbs. plasterer's hair	-	½d.	0	1	3½
Sirapite	-	-	0	9	0
Laths to carpenter's account.	-	-	-	-	-
Lime, sand and cement to brick-layer's account.	-	-	-	-	-
			£ 0 10 3½		

Painter and Decorator.			£ s. d.		
Water paints, Matsene and colour in oil	-	-	1	3	6

Ironmonger.			£ s. d.		
2 Canadian latches	-	4½d.	0	0	9½
12 cockspurs	-	3s. 6d.	0	3	6
4 rim latches, complete	-	10½d.	0	3	6
1 pair 16in. cross garnets	-	4½d.	0	0	4½
2 pairs 14in.	-	3½d.	0	0	7
27 yds. 4½in. ogee gutter	-	rod.	1	2	6
2 4ft. lengths " "	-	1s.	0	2	0
3 4½in. outlets " "	-	9d.	0	2	3
4 " ogee ex. angles	-	9d.	0	3	0
3 yds. 2½in. r.w. pipe	-	10½d.	0	2	7½
4 " " "	-	9d.	0	3	0
3 " " shoes	-	6d.	0	1	6
3 " " gin. S necks	-	1s. 6d.	0	4	6
9 hat hooks	-	6d. doz.	0	0	4½
Screws (various)	-	-	0	3	1½
Nails	-	-	0	19	4½
2 24in. mantel registers	-	10s. 10½d.	1	9	0
1 20in. " "	-	-	0	7	10½
1 portable copper	-	-	1	10	0
1 " Sure Togo " range	-	-	1	3	0
1 earth-closet pail	-	-	0	2	6
½ lb. best glue	-	-	0	0	1½
4 hip irons	-	6½d.	0	0	2
1 Adamsex sink	-	-	0	10	0
1 pair 4in. butts	-	-	0	0	3
2½ cwt. 4lb. lead	-	17s. 6d.	2	3	9
19 pairs 3in. butts	-	1s. 4d.	0	2	3½
1 rim lock, complete	-	-	0	0	2
2 knobs and buttons	-	-	0	0	5
2 4in. tower bolts	-	-	0	0	4
2 6in. " "	-	-	0	0	9
3 doz. gutter bolts	-	-	0	0	3
1 gin. necked bolt	-	-	0	0	3
13 casement stays	-	-	0	0	3
			£ 11 3 5		

Labour.			£ s. d.		
Excavator and concretor	-	-	1	6	5½
Brickwork, tiling, paving	-	-	17	12	6
Carpenter and part joiner	-	-	20	9	10
Plasterer	-	-	5	10	0
Painting and decorating	-	-	3	11	7½
			£ 48 10 5		

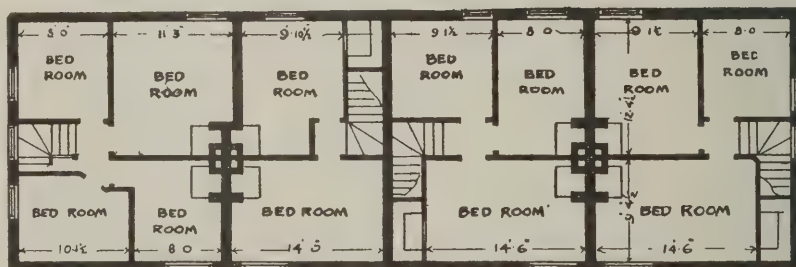
Summary.

Concrete, &c.			£ s. d.		
Concrete, &c.	-	-	2	17	11
Brickwork, &c.	-	-	27	17	8½
Carpenter and joiner	-	-	28	13	5½
Plasterer	-	-	0	10	3½
Painter and decorator	-	-	1	3	6
Ironmonger	-	-	11	3	5
Labour	-	-	48	10	5
			£ 120 16 8½		

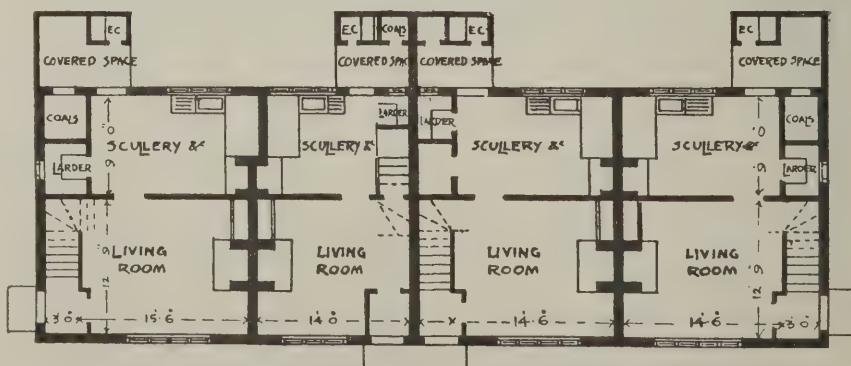
Writing to the "Times" in reply to Mr. Clough's criticism of his cottages (see last week's issue) Earl Carrington says: "The gravamen of his charge seems to be that by building a good substantial labourer's cottage for £150 I have done and am doing what he apparently has been unable to accomplish himself. I have this week accepted a tender of £300 from Mr. Wilford, of Newport Pagnell, for the building of a pair of 'Carrington cottages' to replace those destroyed by the recent fire in the village of Castlethorpe, which I shall be delighted to show Mr. Clough when finished."

Mr. Henman's Cottages.

As regards the cottages by Messrs. Henman & Cooper, FF.R.I.B.A., they estimate that under favourable conditions they could be built at an average of £100 per cottage, but they were faced with difficulties at Letchworth. The Garden City Co. and the local authority made requirements which added to cost, and there was difficulty in getting a builder to undertake the work at all. They are not yet able to give the total cost, but it has somewhat exceeded £100 each. It must, however, be noted that they did not strive to get the cheapest possible structures; also that they declined to compete in any class of the exhibition. In 1876 Mr. Henman propounded plans on the principle of these cottages in a paper entitled "Economic Construction of Dwellings for the Working Classes," and although much has since been done for the better class of artizan, comparatively little progress has been made in providing for a very numerous class of



• FIRST FLOOR PLAN •



• GROUND PLAN •

SCALE OF 1" = 10' 0" 10' 20' 30' 40' 50' FEET.

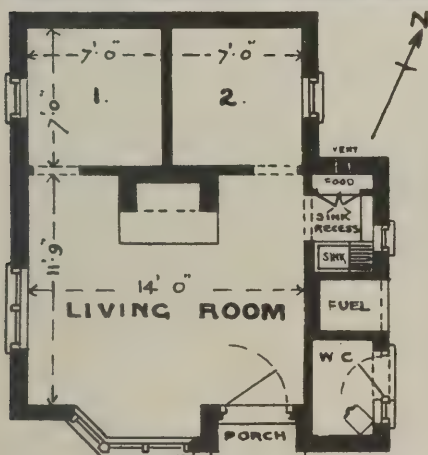
BLOCK OF FOUR COTTAGES AT LETCHWORTH. C. M. CRICKMER, ARCHITECT.

BIRMINGHAM ARCHITECTURAL
ASSOCIATION.

Green Book.

THE Green Book of the Birmingham Architectural Association for the current session has just been issued. In the course of the annual report for 1904-05, dealing with various professional matters, the council draw attention to the procedure of the R.I.B.A. council in its elections to Fellowship of the Institute—about which other societies have expressed disapproval, more especially the Associates at Leeds. The Birmingham council say:—

"It has been felt pretty generally, not only by our own but by other affiliated societies, that the R.I.B.A. council exercises no efficient discrimination as regards the qualifications of applicants for direct admission to the Fellowship who desire to escape the test of the qualifying examination imposed upon all new Associates. By its own regulations the Institute is required to consult the local societies with regard to such applicants within their respective provinces, but these regulations have been practically disregarded, and, what is worse, the recommendations of the local societies have been ignored when the attention of the R.I.B.A. council had been drawn to the point at issue. The



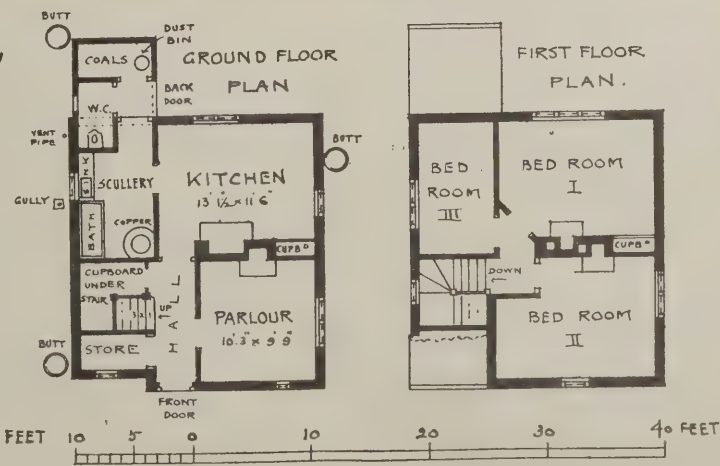
COTTAGE WITH TWO BED RECESSES AT
LETCWORTH.
HENMAN AND COOPER, ARCHITECTS.

workers who now are compelled to live in separate rooms of tenements constructed for only a single family, and in which there is only one set of sanitary conveniences and cooking accommodation, which have to be used by several families. Messrs. Henman & Cooper's cottages provide the smallest possible accommodation, but each gives a complete home, with all necessary domestic and sanitary conveniences. For city and town use the plan can be adapted to tenement dwellings in flats, two dwellings being entered off each staircase landing.

Mr. Houfton's Cottage.

On pp. 254-256 of this issue will be found the working drawings of the cottage designed by Mr. Houfton, which secured the £100 prize for the best £150 cottage, together with detail drawings which explain the design fully. The plan is a good one, and difficult to improve upon without entire reconstruction and losing some advantages which would be thought by some to be more desirable than any other advantages gained.

The new Parish Church at Dundivan, Coatbridge, the memorial stone of which was laid on Saturday last, is built of red stone from Closeburn Quarries, Dumfries, and has been designed by Mr. Alexander Cullen, F.R.I.B.A. The building has a well-proportioned tower surmounted by a Scots crown and provided with a bell. The cost of the church is £10,000.



COTTAGE AT LETCWORTH. ALLEN FOXLEY, ARCHITECT.

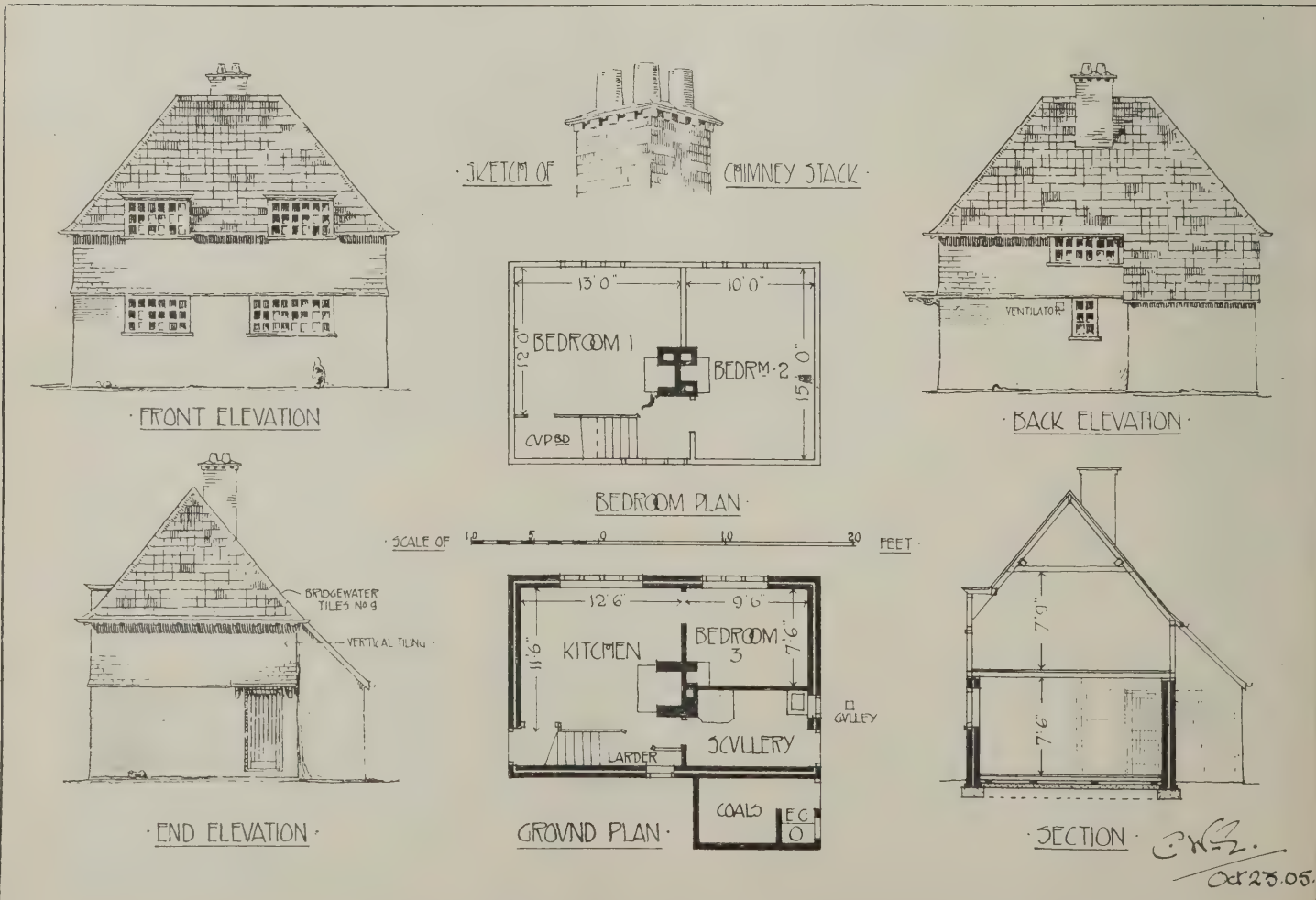
council of the Institute therefore drew down upon themselves the adverse vote which in some cases nullified their nominations for the Fellowship."

The Birmingham council have also taken action with regard to protecting the interests of Birmingham architects when the proposed council house extension scheme becomes ripe for detailed consideration. It was felt that there might be a considerable risk of an appointment being made which would entirely disregard the claims of local architects to, at any rate, a competition with outsiders for the work. The president interviewed the late Lord Mayor on the subject, and secured a promise that the question should be brought before the special committee dealing with the matter. The promise was fulfilled, and though the Birmingham Association have received no definite reply, it is understood that their request will be complied with.

With regard to registration the council observe that the recent elections to the Institute council would appear to be unfavourable to an early settlement of this much-debated question.

The programme for the current session is as follows :—

- Nov. 3rd.—Presidential address.
- Nov. 17th.—Mr. R. Catterson-Smith on "Ornamental Design, and how it should be taught."
- Dec. 1st.—Mr. J. Starkie Gardner on "Metal applied as External Decoration to Buildings."
- Dec. 15th.—Mr. J. A. Gotch on "The Homes of Queen Elizabeth's Courtiers."
- Jan. 5th.—Mr. Mowbray A. Green on "The Eighteenth-century Architecture of Bath."
- Jan. 19th.—Address by Mr. E. C. Middleton.
- Feb. 2nd.—Mr. H. V. Lanchester on "Cardiff Municipal Buildings."
- Feb. 16th.—Mr. Percy S. Worthington on "Homes of the Monks during the Middle Ages."
- Mar. 2nd.—Prof. Beresford Pite on "Architectural Effect in Cities."
- Mar. 16th.—Lecture to be announced.
- Mar. 30th.—Mr. J. Ward on "An Excursion to Mont St. Michael."



MR. A. H. CLOUGH'S PRIZE COTTAGE (NO. 71) AT LETCHWORTH.

Competitions.

Competition for new School, Carlisle.—On Wednesday last it was decided by the School Management and Building Joint Committee to recommend to the Education Committee for acceptance the following report on the competitive designs for the Norman Street schools. The first premium (of £75, to be merged in the usual commission) to Messrs. Oliver & Dodgshun; the second of £30 to Mr. F. Lishman; and the third of £20 to Mr. J. W. Benwell—all of Carlisle. Accommodation for forty defective children is included in the design, the total cost of which is estimated at about £12,000. Five designs were submitted. Mr. W. H. Brierley, of York, was the assessor.

Shop Fronts.—Messrs. W. H. Smith & Son, the well-known railway bookstall newsagents, &c., of 186, Strand, London, W.C., recently promoted a competition for designs for shop fronts, offering a prize of £75 for the best. This firm has now decided that the drawings sent in by Messrs. J. & J. B. Ednie, of 81, Ashley Terrace, Edinburgh, and Mr. James W. Morton, of 13 Wellington Square, London, S.W., are equal in merit. In these circumstances they have added £25 to the prize, and with the consent of the two competitors in question have awarded £50 to each of them. We are informed that the designs will not be exhibited, nor do Messrs. Smith propose to have them photographed by any journal. The latter resolve we can appreciate, but it was only fair to the competitors to have given them an opportunity of judging whether the award was a fair one; and as Messrs. Smith have apparently acted with the best intentions, it is only to be regretted that they should have followed the same secretive policy that has too often cloaked unfair awards. Their policy, too, in putting competitors to the additional trouble of applying for the drawings before returning them is also faulty.

Competitions for Schools, co. Durham.—The Durham County Education Committee recently invited about thirty architects to submit designs for three proposed elementary schools, and the award has just become known. The largest school, to be built at Shildon, provides accommodation for 350 infants, 350 girls and 350 boys, with special cookery, science and manual training rooms. The design placed first (5 per cent. commission) is by Mr. R. Holt, Liverpool; the second (premium £20) by Mr. F. Rennoldson, South Shields; and the third (premium £10) by Messrs. Vaux & Marks, Sunderland. No premiums were offered for the Sedgfield and the Eldon Lane schools, but the winners were to carry out the work and receive the usual commission. The Sedgfield school accommodates 360 mixed and 180 infants. The winning design is submitted by Messrs. Hind & Horsbery, Liverpool; the second by Mr. J. H. Morton, South Shields; and the third by Messrs. Vaux & Marks. The Eldon Lane school provides for 200 mixed and 150 infants, but provision had to be made for a possible future extension of fifty in each department. The successful architects are Messrs. Vaux & Marks; the second Mr. J. A. Wilson, West Hartlepool; and the third Mr. R. Holt. It was a condition that all classrooms should open directly into the central hall, and that no design should exceed in cost £10 per head, plus an extra allowance of 15s. per sup. ft. for central halls and special classrooms. A margin of 2½ per cent. above the architect's estimate for the total cost is given for the actual carrying out. No assessor was named, but the committee have been assisted in adjudicating by their architect, Mr. W. Rushworth, F.R.I.B.A. It was owing to the pressure of work in Mr. Rushworth's departments that these competitions were held.

Builders' Notes.

"The Holy City."—With mushroom-like rapidity a large town has sprung up in the vicinity of Clydebank, the well-known building contracting firm of Messrs. M'Alpine & Son having erected a large number of tenements for the housing of the employees at Singer's factory. The tenements are known as the "Holy City" on account of the position they occupy on the brow of the hill above Singer's works.

Irish Slate Quarries.—The Fouchil and Templebryan Slate and Flagstone Quarries, co. Cork, have been in existence for more than a century, during which long period they have been steadily and profitably worked by the Kingston family. Fouchil slate is said to be quite equal to anything coming from Penrhyn or Portmadoc, not to speak of the famous products of Killaloe. It is a good, hard, sound slate of a dark bluish shade and is well suited to resist all kinds of weather. At the present time, owing to the scarcity of labour, the proprietor, Mr. Kingston, finds it almost impossible to meet the demands. It is suggested that a good opportunity is offered for a company or syndicate to take over and work the quarries.

The Wall Paper Manufacturers, Ltd., have had another successful year. From the commencement of the combine, in 1899, the ordinary shareholders have received 8 per cent., and the directors have decided to retain this rate, though the profits would admit of the full 10 per cent. on the ordinary shares and up to 9 per cent. on the deferred, of which £1,084,621 has been subscribed and called up. The nett profits show an increase of £1,435, while the amount brought into the accounts is £33,527 larger than the corresponding figure last year. The reserve has been augmented by £50,000, as against £30,000, bringing the total up to £180,000.

Registration of Plumbers.—At a large public meeting held at Newcastle-on-Tyne

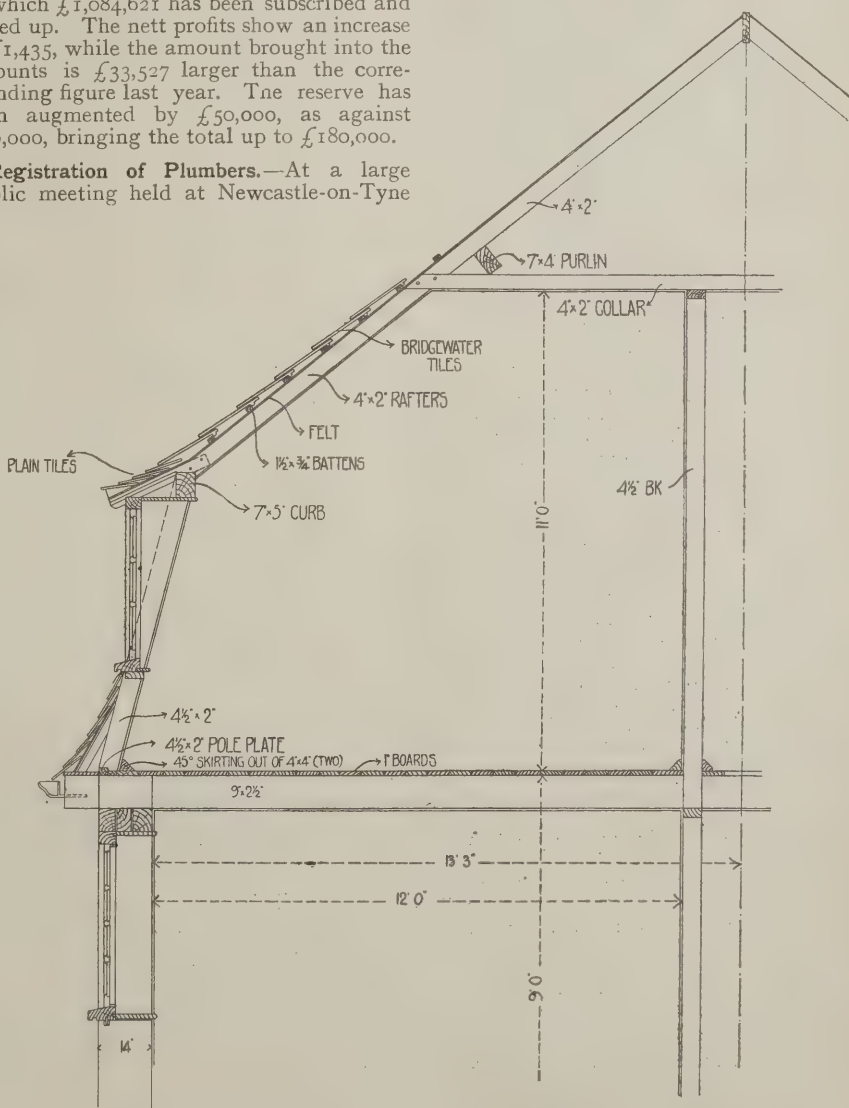
on Friday night the following resolution was unanimously carried: "This public meeting of members of the corporation, architects, plumbers and inhabitants of Newcastle-on-Tyne and the district desires to record its hearty approbation of the action of the Worshipful Company of Plumbers, London, in establishing the national registration of plumbers, with combined systems of apprenticeship, education and examination for plumbers, in order that their competency and responsibility may be duly ensured consistently with the important duties devolving upon plumbers under the regulations of the public health and water authorities."

Views and Reviews.

A new Book on Sewers and Drains.

We reviewed in our columns a short time ago the necessarily portentous work of Messrs. Macmorran, K.C., and Willis on the law of sewers and drains, and now comes a treatise upon the same subject by Mr. A. P. Poley, barrister-at-law. Mr. Poley's work is, however, less ambitious, and is mainly directed to the elucidation of the terms "sewer" and "drain" as they occur in the various statutes and cases dealing with this important and complicated subject. For this reason the work will be valuable to many of our readers, though the necessity for so much literature on the subject is one of the standing disgraces of our English law.

"A treatise upon the law affecting sewers and drains," with plans, by Arthur P. Poley, B.A., of Inner Temple, E.C. London: Eyre & Spottiswoode, East Harding Street, E.C., price 5s.



DETAIL OF MANSARD IN ONE OF MR. CLOUGH'S COTTAGES.

MANCHESTER NOTES.

(By our Own Correspondent.)

THE building trade in the Manchester district is not good and the prospects for the winter are not altogether encouraging, though many worse times have been experienced. The most important building contract in hand is the new infirmary. At the Stanley Grove site 400 men are engaged, and the work is now making rapid progress. The town hall at Stockport is also a scene of great activity, and is an instance of the most energetic and up-to-date methods of erection. In connection with the extension of London Road Station (L. & N.W.) and the widening of the line to Ardwick, only the preparatory demolition has yet been accomplished. Considering the pressing need of the work, the railway company appear to be moving in most leisurely fashion, but this company is not noted for undue haste in the making of improvements.

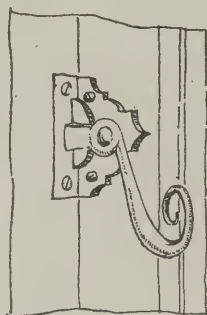
A Great Scheme.

The most important new scheme brought forward in Manchester for many years is that presented to the City Council by a special committee appointed in 1902. This is the rebuilding of about 25 acres between Oldham Street, Victoria Street, Market Street and Cannon Street, and the provision of a new road parallel with Market Street, which is to relieve that crowded thoroughfare. The property to be pulled down is mostly of old type, the streets and alleys are narrow, and the block as a whole is, at present, no credit to the city. Under the scheme the new street running down the centre of the plot from Oldham Street to Victoria Street would be from 16 yds. to 20 yds. in width. It is proposed that the buildings between it and Market Street shall be of the arcade type. The design prepared by Mr. Price, the city architect, shows footway bridges along the new thoroughfare on the first level, so that there could be a double row of shops. Stairways at convenient intervals would give access to the upper floors. It is proposed that the Corporation acquire the property under parliamentary powers, subsequently delegating to syndicates the actual building. The total estimated cost is £1,300,000, but the nett cost, after allowing for the sale of residue lands and the value of chief or ground rents, is put at £250,000. This great scheme is the alternative to a proposal made some years ago that the work should be done by a private company, who prepared and presented to Parliament a Bill with this object. The scheme will undoubtedly meet with strong opposition.

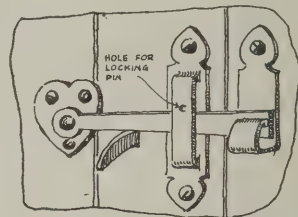
Foreign Granite in Manchester.

The first foreign manufactured granite for building purposes erected in Manchester is now in position at the new Stock Exchange. As it happens, a similar type of granite work has recently been supplied from Cornwall to the Victoria Station extension, and in the new buildings of the Co-operative Wholesale Society Scotch granite is being erected. There is, therefore, an excellent opportunity of comparing the three kinds. The most cursory glance is enough to reveal the inferiority of the foreign worked material, from every point of view except cost. The stone itself is of a dingy, indeterminate colour, the workmanship is rough, and the joints are of all widths. Apparently the first cheapness of the material will have been largely discounted by the extra cost of setting. It really seems unfair to put British makers and British standards in competition with such work as this.

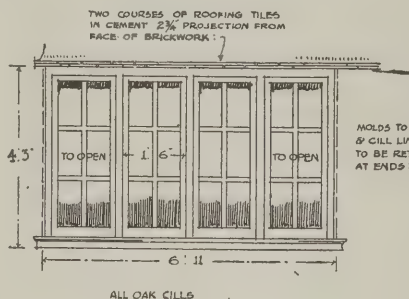
A new County Asylum for Surrey is being erected at Merstham. Mr. G. T. Hine is the architect. It is to accommodate 900 patients in the first instance, and subsequently 1,200. Messrs. J. Bowen & Sons, of Birmingham, are the contractors for the work.



SKETCH OF
CASEMENT
FASTENER.

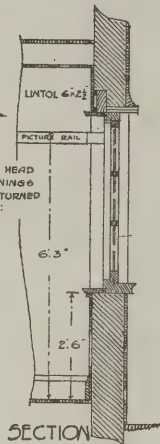


SKETCH OF DOOR LATCH.

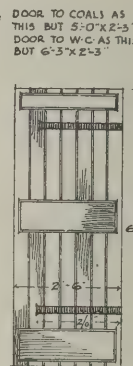


NOTE: THE CASEMENTS THROUGHOUT ARE ALL THE SAME WIDTH VIZ. 1' 6" OVER ALL.

EXTERNAL ELEVATION.



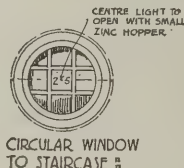
SECTION.



INNER DOORS.

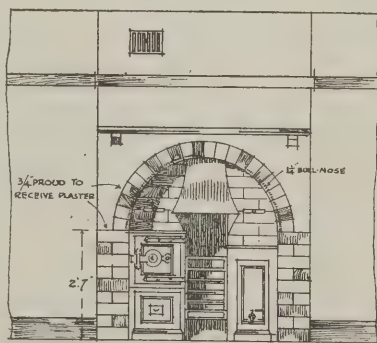
No.	HEIGHT OVER ALL	WIDTH ALL	No. OF LIGHTS	HEIGHT FROM FLOOR	LIGHTS TO OPEN	POSITION
1.	4'-3"	6'-11"	4	2'-6"	2 OUTER	SCULLERY & LARDER.
2.	4'-3"	5'-3"	3	2'-6"	2	LIVING ROOM.
3.	4'-0"	5'-3"	3	1'-6"	2	BEDROOMS 1 & 2 & 3.
2.	2'-3"	2'-0"	1	3'-9"	1	COALS & W.C.

DETAILS OF
WINDOWS.

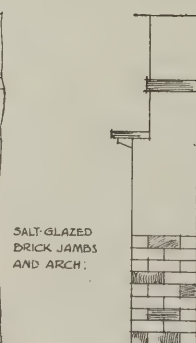


CIRCULAR WINDOW
TO STAIRCASE.

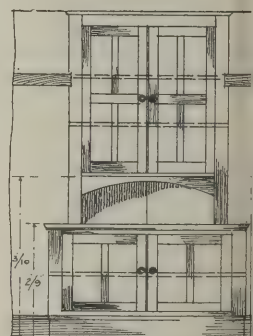
DET
COTTA
WORT



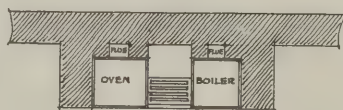
FRONT ELEVATION.



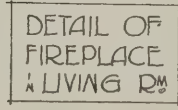
SIDE ELEVATION.



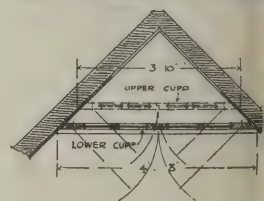
BEAD ON FRAMING TO BE NOT MORE



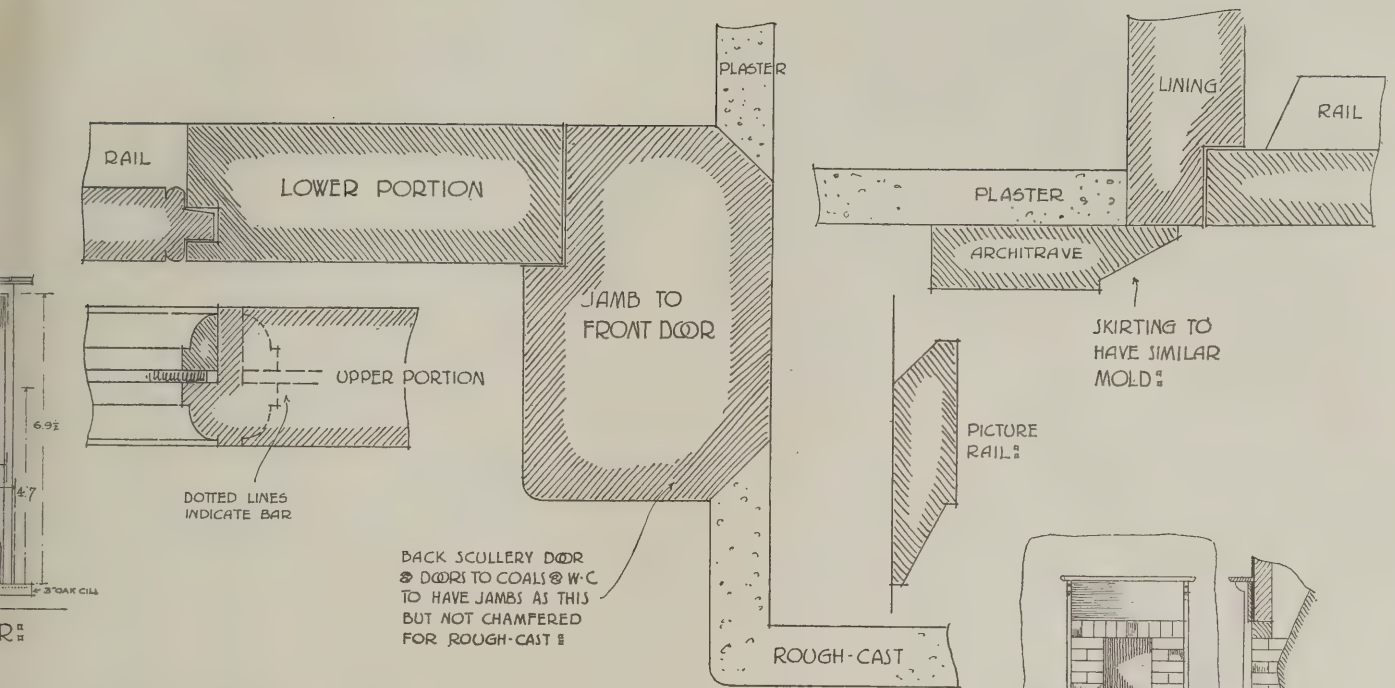
PLAN.



DETAIL OF
FIREPLACE
IN LIVING RM.

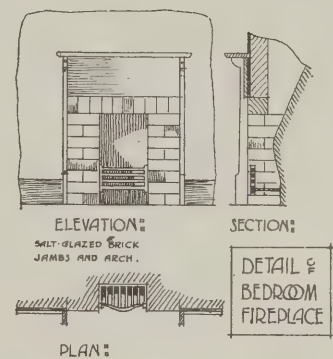


INCHES 0 1 2 3 4 5 6 7 8 9 10 FEET



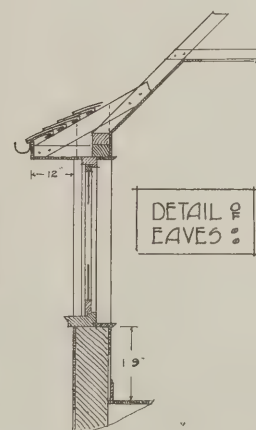
LS OF
AT LETCH
BY: B. HOFFMAN ARCHT.
ESTERFIELD: 1905:

DETAILS
OF DOORS



DETAIL OF
STAIRCASE:

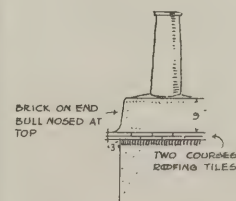
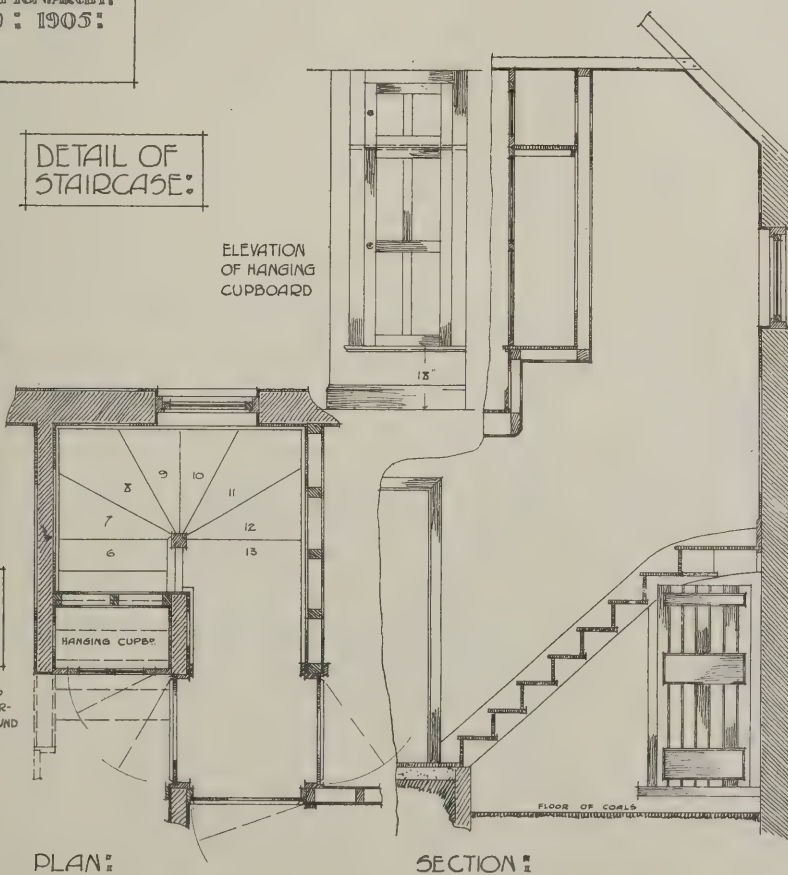
ELEVATION
OF HANGING
CUPBOARD



EDGE MOLD
TO TOP

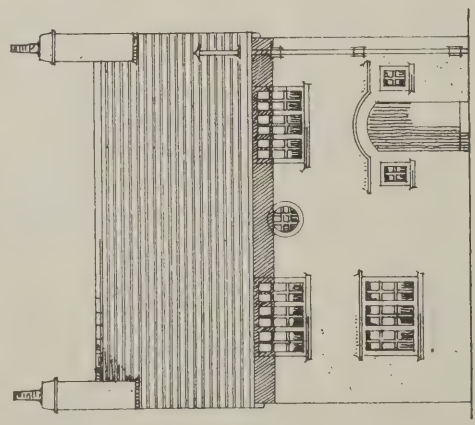
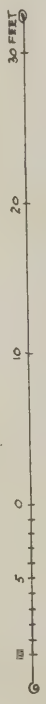
DETAIL OF
RESSER
LIVING RM

DOTTED LINES
INDICATE STAIR-
CASE ON GROUND
FLOOR

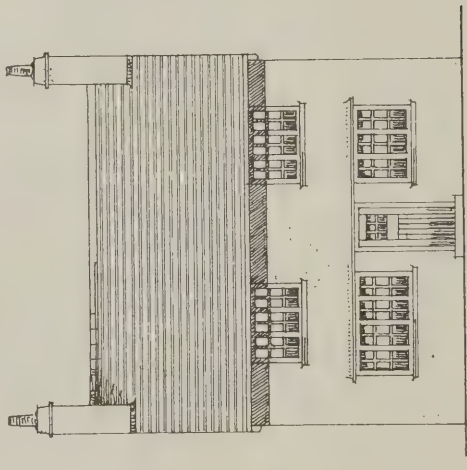


PLAN OF COTTAGE PROJECTED AT LEITCHWORTH

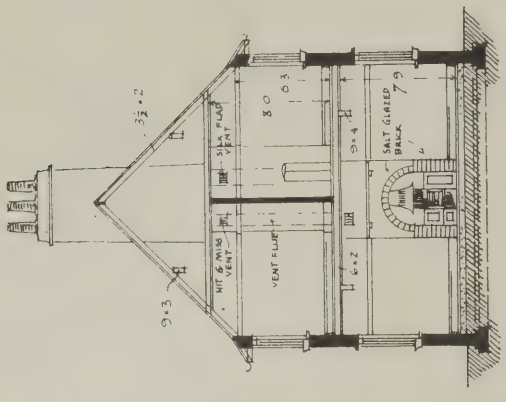
PERCY B. HOVFTON
 ARCHT: CHESTER-
 FIELD: OCT. 1905.



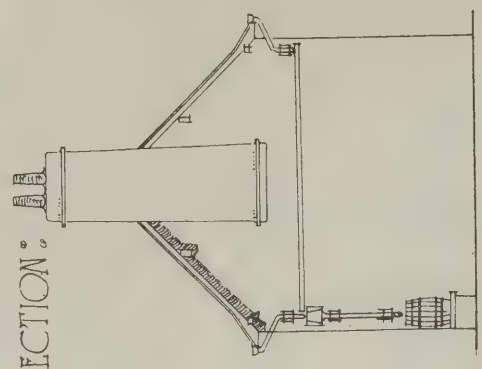
SOUTH ELEVATION



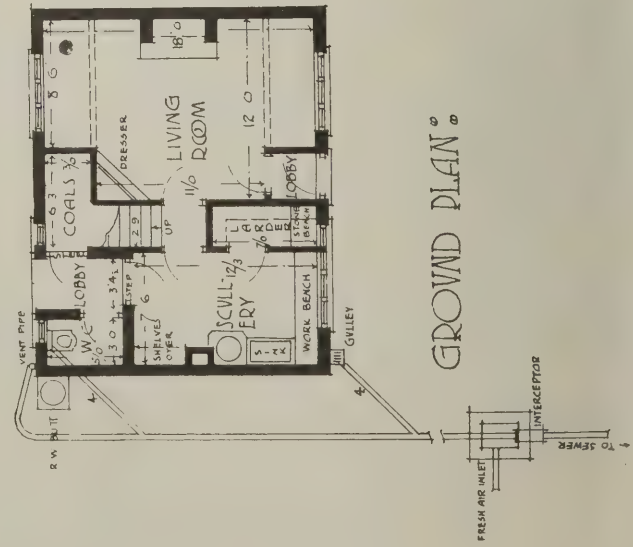
NORTH ELEVATION



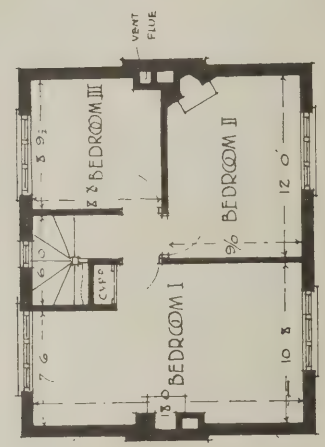
SECTION



END ELEVATION



GROUND PLAN



FIRST FLOOR PLAN

VENTILATOR,
 INSERTED INTO
 SMOKE FLUE
 IN EACH BEDRM

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions must in all cases be addressed to the Editor and be written on one side of the paper only.

Books on Hydrostatics and Arbitrations.

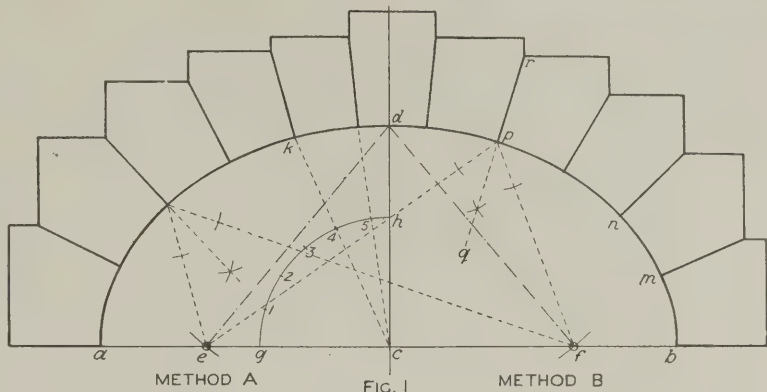
BROMLEY.—H. E. G. writes: "Which are the best text-books on hydrostatics and arbitrations to study in connection with the Surveyors' Institution Fellowship Examination?"

Lardner's "Handbook of Hydrostatics and Pneumatics," by B. Lowey, price 5s., post free from our offices; Redman's "Law of Arbitrations and Awards" (Butterworth & Co., publishers).

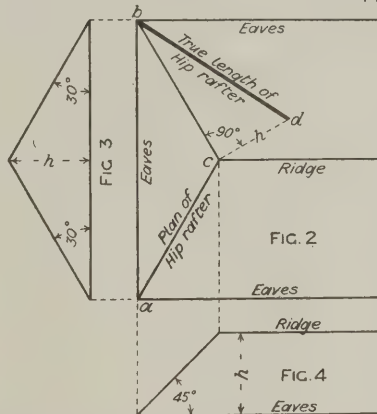
Setting-out an Elliptical Arch and Determining Length of Special Hip Rafter.

BRADFORD.—MODULE writes: "Please show the best way to set out the joints of a stone elliptical arch and how to obtain the true lengths of hip rafters when the roof is hipped back at a different angle to the main roof."

Fig. 1 shows alternative methods, A and B, of setting-out the joints of an elliptical stone arch. First set out the span ab and rise cd , then with a pair of compasses take length ac and with centre at d strike arcs cutting ac and cb in points e and f , which are the foci of the ellipse. Now set out the ellipse, by means of a trammel for preference, and the outline of the intrados will be obtained. In method A it will be seen that the size of each voussoir decreases as the centre of the arch is approached. This is brought about as follows:—Taking any convenient radius in a pair of compasses and with centre c strike arc gh , then step off on this arc points 1, 2, &c., according to the number of voussoirs it is required to have in the arch (in this case 11), always remembering that the number should be odd in order to obtain a keystone and not a joint in the centre. Having obtained the points correctly, a line from c produced through any point 4 will cut the ellipse at k , where a joint will occur. In method B the joints m, n , &c., are obtained by trial by stepping along the ellipse with a pair of dividers; this method produces voussoirs more nearly of one size. The method of finding the angle of the joints, which should be normal to the curve of the ellipse, is as follows:—Having obtained the required positions of joints by either of the above methods, say point p , join same to the two foci e and f , then bisect the angle between these two lines by the line gq and produce through, cutting off the length pr according to the length of joint decided upon. Then horizontal and vertical lines give the junctions of the voussoirs with the wall. For the second question on length of hip rafter, draw the plan of roof as in Fig. 2, leaving out the plan of hip rafters for the present, and producing ridge line indefinitely. Next set off a cross-section of the main roof as in Fig. 3, assuming the slope to be 30 degs.; this will give the height to ridge (h). Now assuming the end to be hipped at 45 degs., set out the horizontal section, Fig. 4, making the height equal to h in Fig. 3; then the point where the 45 degs. line cuts the ridge line may be produced up to Fig. 2, as shown by dotted line, until it intersects the indefinite ridge line already drawn in point c . This point may now be joined to the two corners a and b giving the plan of hip rafters. From point c



SETTING-OUT ELLIPTICAL STONE ARCH.



DETERMINING LENGTH OF HIP RAFTER.

set out at right angles to cba a line cd equal to the height h in Figs. 3 and 4. Join d to b , which will be the true length of hip rafter.

HENRY ADAMS.

Flow of Water in Pipes.

STIRLING.—A. W. writes: "A reservoir, say 30ft. high, gives a pressure of 40lbs. at the basement of a house. If a supply pipe 38ft. high and $\frac{3}{4}$ in. bore were taken from basement to upper floor, what would the pressure be at the upper floor? Is there any formula for this? Please name a good book on hydrostatics."

In solving questions upon the flow of water in pipes there are certain general principles to bear in mind. The statical pressure, that is, when there is no draught from the pipes and everything is quiescent, is due simply to the difference in level between the highest standing point of the water and the place of measurement. This is called the head, and is measured in feet. The pressure per sq. ft. at the bottom is the same as if the water were piled up vertically to the height of the head, and as water weighs, say, $62\frac{1}{2}$ lbs. per cub. ft., the pressure (P) per sq. ft. for any given head (H) will be $P = 62\frac{1}{2} H$. It is, however, more convenient to measure the pressure in lbs. per sq. in.; $62\frac{1}{2}$ will therefore be divided by 144, making 0.434 for the constant. Then the pressure in lbs. per sq. in. = $0.434 H$. When the water is flowing there will be water due to friction against the interior surface of the pipe, to energy absorbed in passing bends, branches, valves, &c., to eddies produced by irregularities in diameter and shape of flow, and to draught from intermediate points, for all of which no precise value can be fixed. Before any flow can take place there must be an unbalanced pressure at the outlet, as occurs when a tap is opened. The flowing stream is urged by the weight of water behind, or, in other words, by the head. A small part of this head goes to produce the required velocity at the outlet and the remainder to overcome the friction and other losses. The amount of head required to produce the velocity is measured by

the formula $H = \frac{G^2}{215d^4}$, where H = head in feet, G = gallons per minute, L = length in yards, d = diameter of outlet in inches. The head required to overcome friction in the pipes, taking different diameters separately in $H = \frac{G^2 L}{240d^5}$, the letters having the same

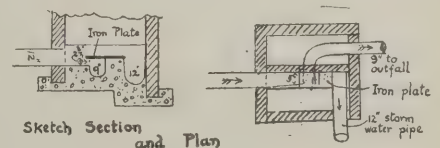
significance as before. In the case set by querist it must be presumed that the 40 lbs. pressure in the basement is what is left after allowing for all the losses named above, as a head of 30ft. would give a statical pressure of $300 \times 0.434 = 130.2$ lbs. per sq. in. Then the virtual head due to a statical pressure of 40 lbs. per sq. in. would be $40 \div 0.434 =$ say 92ft.; from this must be deducted 38ft., the height to which the outlet is carried, making an effective head of 54ft. available for calculation. Assume 20 gallons per minute on an outlet of $\frac{3}{4}$ in. diameter, then the head required to produce the requisite velocity for this would be $H = \frac{G^2}{215d^4} = \frac{20^2}{215 \times \frac{9}{16}} =$ say 30ft. The head to overcome friction in the $\frac{3}{4}$ in. pipe would be $H = \frac{G^2 L}{240d^5} = \frac{20^2 \times 12\frac{1}{2}}{240 \times \frac{243}{32}} =$ say 88ft.; making together $30 + 88 = 118$ ft. head required to pass 20 gallons per minute. There is, however, only 54ft. head available, so that the discharge will be reduced to

$20 \times \sqrt{\frac{54}{118}} = 20 \times .68 = 13.6$ gallons per minute. The section on hydraulics in the "Engineers' Handbook" (Spoon, 4s. 6d. nett), will be found useful in determining questions of this kind.

HENRY ADAMS.

Storm Overflow Weir.

THAME.—WEIR writes: "What type of storm overflow weir would you recommend on a 12in. sewer laid at a gradient of 1 in 23 (iron pipe) carrying a d.w.f. of about 6,800 gallons per twenty-four hours? Will you kindly show me how to calculate the width and height of a leap weir to carry away more than six times the above d.w.f.? I find (see Box's 'Hydraulics,' p. 65) that a weir similar to sketch would work out at 5ins. wide by 2 $\frac{1}{2}$ ins. deep. I do not like the idea of contracting a 12in. channel to 5ins.; the height also is too small in my opinion."



We do not like the type of weir shown, or in fact any type of weir in which the sewage has to flow through an orifice. A better type is the simple overflow—i.e., when the sewage has risen in the front sewer to a height equivalent to six times the dry weather flow, it is just level with the top of



NEW PUBLIC BATHS AT CAMBERWELL: FIRST-CLASS BATH, LOOKING TOWARDS DEEP END, ARRANGED FOR USE AS A HALL IN WINTER, WITH FLOOR AND PLATFORM. E. HARDING PAYNE, A.R.I.B.A., ARCHITECT.

NEW LONDON BUILDINGS.

AT yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendation as to consent or refusal being appended in *italics*:—

Buildings upon the site of Nos. 117 to 131 (inclusive), Stockwell Road, Brixton, on the application of P. Tree on behalf of Foster's Trustees. (*Consent.*)

Oriel windows and a projecting balcony at Nos. 2, 3 and 4, Cheapside, on the application of F. Rowntree, on behalf of The Scottish Temperance Life Assurance Co., Ltd. (*Consent.*)

A projecting balcony at No. 80, Portland Place, St. Marylebone, on the further application of Boehmer & Gibbs, on behalf of Matthews, Rogers & Co. (*Consent.*)

Residential flats, with bay windows, upon the site of Nos. 79 to 105 (odd numbers only) inclusive, Park Road, Regent's Park, on the further application of Sir Arthur Blomfield & Sons, on behalf of H. Johnson. (*Consent.*)

Buildings on the front portion of "The Nook" estate, to abut upon Tooting Bec Road, next Tooting Common, on the application of W. C. Poole, on behalf of Coates. (*Refusal.*)

An iron and glass shelter at the entrance to De Keyser's Royal Hotel, Victoria Embankment, City, on the application of J. W. Singer & Sons, on behalf of De Keyser's Royal Hotel, Ltd. (*Refusal.*)

A building on a site abutting upon Prah Road and St. Thomas Road, Finsbury Park, on the application of F. Matcham & Co. (*Refusal.*)

An addition at the western end of Christ Church, Christ Church Street, Chelsea, with external walls at less than the prescribed distance from the centre of the roadway of the street, on the application of E. Geldart, on behalf of the Rev. J. P. Thompson. (*Refusal.*)

A modification of the provisions of that section with regard to open spaces about buildings so far as relates to the proposed erection of Nos. 8, 9 and 10, Lower Marsh, Lambeth, with irregular open spaces at the rear, on the further application of W. H. Rogers. (*Consent.*)

A deviation from the drawings approved on April 17th, 1905, in respect of the means of escape in case of fire proposed to be provided in pursuance of section 63 of the London Building Act, 1894, on the fifth (top) storey of Nos. 118 to 122, Holborn, on the application of J. Sawyer, on behalf of A. W. Gamage, Ltd. (*Consent.*)

A sub-station on the southern side of Randolph Mews, Portsdown Road, Paddington, on the application of S. H. Highfield, on behalf of the Metropolitan Electric Supply Co., Ltd. (*Consent.*)

A new street for foot traffic only at the rear of houses on the east side of Godfrey Street, Woolwich, on the application of F. C. Hensley and S. A. Douglass. (*Refusal.*)

NEW BATHS AT CAMBERWELL.

THE new baths in Old Kent Road, London, S.E., have been designed by Mr. E. Harding Payne, A.R.I.B.A., of 11, John Street, W.C. (selected in competition), and comprise swimming, warm, douche, Turkish and Russian vapour baths and washhouses. The site is small. The principal feature of the plan is the first-class swimming bath, which had to be arranged in view of its

being used as a public hall in winter. The accompanying photograph shows it as such. The gallery seats are Nicholl's patent automatic rising seats, and the railing in front is of ornamental wrought-iron executed by Messrs. George Wragge, Ltd., who also supplied the railings in front of the building. The bath is lined throughout with ivory white glazed bricks with coloured bands and dadoes by the Leeds Fireclay Co., who have supplied all the glazed bricks used in the build-

ing. The gangway around the bath is laid with non-slipping tiles supplied by Messrs. G. Woolliscroft & Son, Ltd., with slate coping and terrazzo flooring in dressing-boxes. The bath is 75ft. by 30ft., and is lighted by twelve 5-light pendants and four arc lights. The floor is supported by deal trusses in the well of the bath. The second-class bath measures 75ft. by 29ft. The slipper baths are divided into three classes. They are each 6ft. square, and divided from one another by rin. slate divisions supplied by Messrs. Congdon & Powell, those in the first-class being enamelled and in the third-class plain slate oiled. The baths are of white enamelled fireclay supplied by the Leeds Fireclay Co., Ltd., and are enclosed with slate sides. The whole of the engineering work in connection with the baths was designed by Mr. W. M. Binny, A.M.I.C.E., of Teddington. The clock on the exterior (here shown) has been made by Messrs. Gillett & Johnston, of Croydon. The works are fixed inside the building, the movement being transferred through bevel gearing. The case was designed by the architect and is of oak. It is over 10ft. high, and the dials are 3ft. 6ins. in diameter, electrically illuminated.





QUEEN VICTORIA MEMORIAL STATUE, YORK. G. W. MILBURN, SCULPTOR.

This memorial was unveiled last week by Princess Henry of Battenberg. The figure is of white marble on a dark red base and is placed in the Guildhall. It is the work of Mr. G. W. Milburn, of York. The weight of the statue is between 3 and 4 tons, and the block is practically flawless.

ARCHITECTURAL REFINEMENTS.

MR. WILLIAM HENRY GOODYEAR, of the Brooklyn Institute of Sciences and Arts, last week delivered his second lecture in connection with the exhibition of photographs illustrative of architectural "refinements" present in Italian and French churches, at present being held at the Scottish National Portrait Gallery, Edinburgh. Continuing his description of the cathedral of Pisa, Mr. Goodyear said the folly of the argument that the builders of the Middle Ages were incapable of intentionally creating picturesque effects was demonstrated by an examination of various startling asymmetries in the cathedral. The columns of the nave, he pointed out, were of irregular size, because they were obtained from various ancient ruins in Sicily; but the arrangement of these columns was proved to be schematic, because they found that all the large columns were on the south side of the nave and all the small columns on the north side. The law of chances showed that such an arrangement must have been schematic. The average difference of height between the two ranges of columns was over $1\frac{1}{2}$ ft. This decentred the church optically and gave an agreeable effect of the quartering view when the church was studied from the exact centre. The arrangement also produced a confusion of optical effects resulting in a sort of optical vibration, or an effect of "life." In the same way the columns of the south transept were $2\frac{1}{2}$ ft. higher on the west side than they were on the east side. It was inconceivable that all the larger columns should have

been placed on one side of the transept by accident.

The levels of the great string-course which divides the lower storey of the cathedral on the exterior were described in detail. The levels had been taken for the pavement as well. To the east of the west sides of the transepts the cathedral was built to the earth's surface, so that the pavement was $4\frac{1}{2}$ ft. lower at the south-east angle of the choir than it was at the north-west angle of the façade. The cornice was carefully build to the same slope on the east of the west sides of the transepts, but on the west sides of the transepts and on the sides of the main body of the cathedral another system was found. Here, on both the north and south sides, the string-course sloped downward toward the transepts, being 2 ft. out of level as compared with the plinth-course and about the same amount as compared with the true level. On the other hand, the string-course on the west sides of the transepts sloped down to the angle of meeting with the north and south sides about $\frac{1}{2}$ ins. on each side, as compared with the plinth-course, and in a direction opposed to that of the slope of the plinth-course.

The lecturer pointed out that a confusion of optical effects rather than an effect confined to any one direction was the inevitable outcome of this arrangement, although it must also be admitted that a material increase of apparent dimension was also obtained for points of view facing eastward. As regards this optical confusion, he quoted Mr. Ruskin's self-confessed inability to determine whether there was any slope at all in

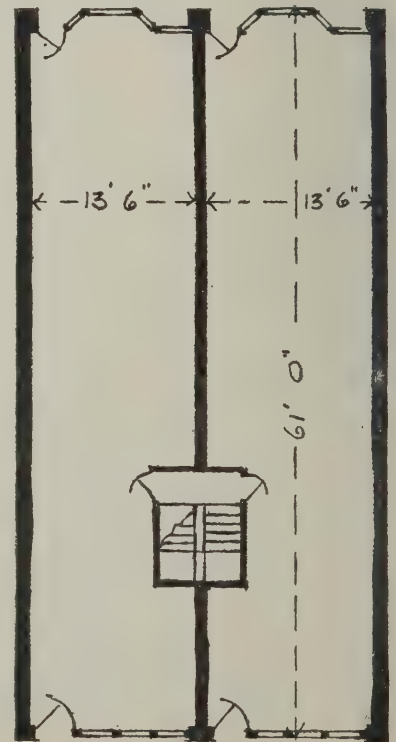
the string-course of the south wall, as mentioned by him in the Lamp of Life ("Seven Lamps of Architecture").

Referring to the tower, the lecturer described the observations of Ranieri Grassi, made in 1832, and the corroboration and extension of these observations by his own measurements in the spiral stairway. This stairway is built with varying heights according to its relation to the leaning side. The spiral changes are so arranged as to make the stairway lower on the upper side and higher on the lower side of the lean, thus throwing the greater weight of masonry on the upper side and so increasing the security of the construction. No possible theory of explanation for such a succession of changes in the heights of the spiral stairway could be advanced excepting the one that they were connected with the preconceived design of a leaning construction.

There was a special school of Pisan symmetry, and we needed to be careful not to argue the existence of the same sentiment in territories outside the Pisan influence.

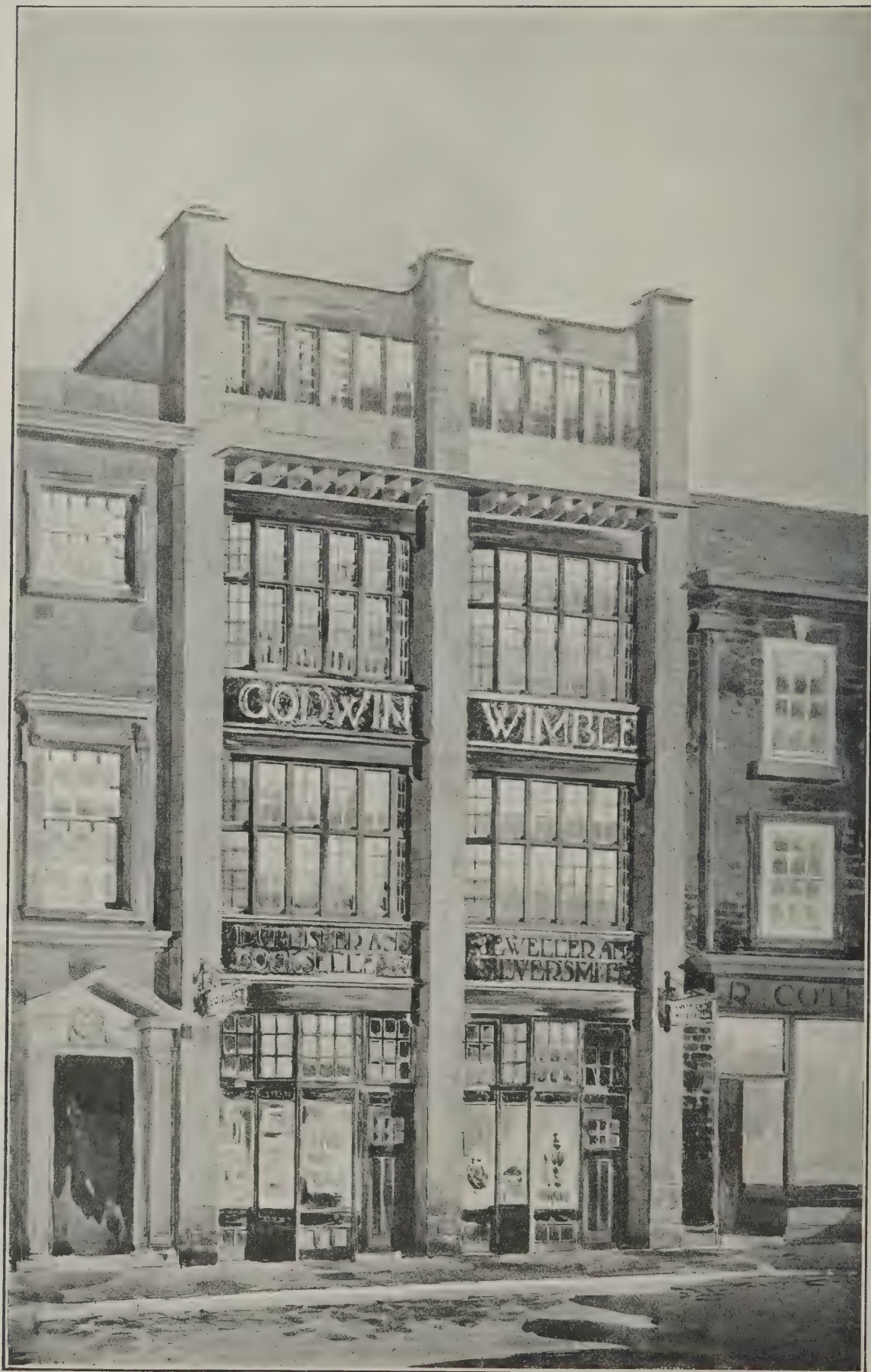
OUR PLATES.

THE shops in a provincial town are intended to be constructed of Portland stone, and are estimated to cost £3,514. The woodwork will be of teak, the windows (excepting the shop front) being filled in with lead glazing, in teak wood and wrought-iron frames. The shop windows will be of plate-glass in teak-wood framing. The roof will be constructed of steel joists and concrete, and covered with Vulcanite. The floor will be similarly formed, and laid with wood blocks. Mr. T. Middleton Shallcross, of Liverpool, is the architect.—The house at Parkstone, overlooking Poole Harbour, is proposed to be carried out in brick, rough-cast, with the roof of Swanage stone slabs and the woodwork treated with Carbolineum or other staining and preserving mixture instead of paint. The house is to be built close up to the roadway which bounds the site on the east front, so that full advantage may be taken of the sloping and terraced gardens on the south and west sides.

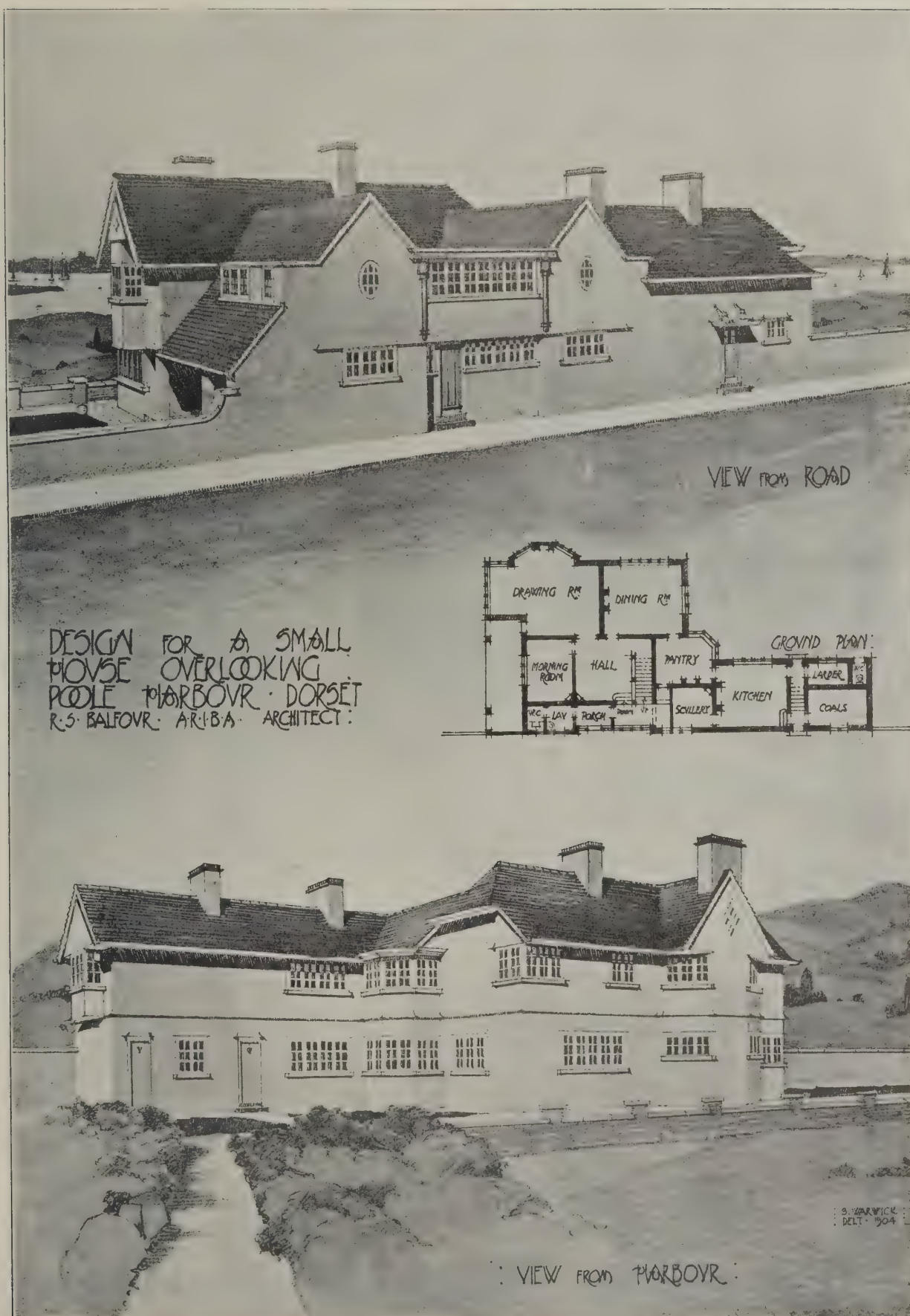


PLAN OF SHOPS IN A PROVINCIAL TOWN.
T. MIDDLETON SHALLCROSS, ARCHITECT.

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OF THE
UNIVERSITY OF ILLINOIS



PROPOSED SHOPS IN A PROVINCIAL TOWN. T. MIDDLETON SHALLCROSS, ARCHITECT. (*Royal Academy Exhibition, 1905.*)



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Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :			
Nov. 2	Amble—House	Trustees	W. Burton, Architect, 69 Queen Street, Amble.
" 2	Appleby—Engine-house, &c.	Guardians	A. Atkinson, C.E., Brigg.
" 2	Hastings—Alterations at Workhouse	Guardians	Architects, 5 Havelock Road, Hastings.
" 2	Lyminge—Storey	Guardians	R. Lonergan, Clerk, 7 Chinton Place, Folkestone.
" 2	Ormskirk—Alterations at Workhouse	Guardians	Mr. Dod, Architect, 16 Exchange Buildings, Liverpool.
" 3	Bradfield—School	Education Committee	F. Whitmore, Architect, Duke Street, Chelmsford.
" 4	Radcliffe—Library	Urban District Council	H. Lord, Architect, 42 Deansgate, Manchester.
" 4	Adbaston—School Extensions	Education Committee	Graham Balfour, Director of Education, Stafford.
" 6	Clitheroe—Fire-escape Staircases	Guardians	T. Eastham, Clerk to the Guardians, Clitheroe.
" 6	Cwmparc—Houses	Parc Isaf Building Club	Park Hotel, Cwmparc.
" 6	London, W.—Conveniences, &c.	Paddington Borough Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington, W.
" 6	Bradford—Extensions to Subway	Guardians	F. Holland, Architect, 11 Parkinson's Chambers, Hustlergate, Bradford.
" 6	Denby Dale—Alterations to School	Education Committee	J. Wickers-Edmunds, County Architect, County Hall, Wakefield.
" 7	Bromley—Municipal Buildings	Council	R. F. Atkinson, Architect, 8 Sackville Street, W.
" 7	Preston—Bridge	County Palatines	County Bridgemaster's Office, Preston.
" 7	Preston—Reconstruction of Bridge	Main Roads and Bridges Committee.	County Bridgemaster's Office, Preston.
" 7	Taplow—Cottages	Great Western Railway Co.	G.W.R. Engineer, Reading Station.
" 7	Wilmslow—House	Great Western Railway Co.	G.W.R. Engineer, Wolverhampton Station.
" 7	Mountain Ash—Houses	Cilhaul Building Club	T. W. Millar, Architect, Mountain Ash, Wales.
" 8	Deri and Cowbridge—School Additions	County Council	County Council Offices, Glamorgan.
" 8	Yealton—House	Lee Brothers	W. T. Tollit, Architect, Totnes.
" 9	Montrose—Post-office	H.M. Office of Works	W. T. Oldneve, Architect, H.M. Office of Works, Edinburgh.
" 9	Sutton—Post-office	H.M. Office of Works	H. M. Office of Works, Storey's Gate, London, S.W.
" 11	Pontymool—Alterations to Offices	Urban District Council	D. J. Lougher, Pontypool.
" 11	Chesterton—Hospital Block	Rural District Council	F. T. Mullett, Architect, Downing Street, Cambridge.
" 11	Wall Heath—School	Education Committee	Education Offices, Stafford.
" 11	Leith—School Additions	School Board	G. Craig, Architect, 85 Duke Street, Leith.
" 13	Antwerp—Theatre	Municipality	Hotel de Ville, Antwerp.
" 14	Shrewsbury—Iron Hospital	Asylum Committee	A. T. Davis, M.I.C.E., Shire Hall, Shrewsbury.
" 14	Tralee—Hall	County Council	Wrenn, Architect, 189 Great Brunswick Street, Dublin.
" 15	Gresmont—School Additions	Managers	A. Swash, M.S.A., Midland Bank Chambers, Newport.
" 17	Canterbury—Post-office	H.M. Office of Works	Secretary, H.M. Office of Works, Storey's Gate, London, S.W.
" 21	Gloucester—School	Education Committee	J. Fletcher Trew, Architect, County Chambers, Station Rd., Gloucester.
" 27	Salford—Offices, &c.	Tramways Committee	General Manager, Tramways Department, Salford.
No date	Hounslow—Villas		E. Pennington, Architect, Richmond.
"	Henbury—Police-station	County Council	County Surveyor, Shirehall, Gloucester.
ENGINEERING :			
Nov. 2	Fleetwood—Hulking	Urban District Council	E. Frobisher, Surveyor, Town Hall, Fleetwood.
" 4	Harrow-on-the-Hill—Detritus Tanks, &c.	Urban District Council	J. P. Bennetts, Surveyor, Harrow-on-the-Hill.
" 4	Ghent—Maritime Installation Improvement	Municipality	Hotel de Ville, Ghent.
" 6	Kilmarnock—Waterworks	District Committee	Shaw & Morton, Engineers, 224 St. Vincent Street, Glasgow.
" 8	Stratton St. Margaret—Storm-water Bed	Rural District Council	Beesby, Son & Nicholas, Engineers, 11 Victoria St., Westminster.
" 8	Helmond—Bridge, &c.	Tramway Co.	Offices of the Tramway Company, De Meijerij, Lindhoven.
" 9	Havana—Pier		Cuban Consulate, London.
" 13	Honor Oak—Reservoirs, &c.	Metropolitan Water Board	District Engineer, Southwark Bridge Road, S.E.
" 13	Oldbury—Heating Apparatus	Education Committee	A. Long, Architect, 21 New Street, West Bromwich.
" 18	Bradford—Heating	Royal Infirmary	F. Holland, Engineer, 11 Parkinson's Chambers, Hustlergate, Bradford.
" 21	Winchcomb—Water-supply Works	Rural District Council	Willox & Raikes, Engineers, 63 Temple Row, Birmingham.
1905.			
Jan. 9	Auckland—Wharf, &c.	Harbour Board	W. & A. McArthur, 150 Leadenhall Street, London, E.C.
PAINTING AND PLUMBING :			
Nov. 2	Northfleet—Painting	Urban District Council	Council Offices, The Hill, Northfleet.
" 2	Barnstable—Painting	Trustees	W. C. Oliver, Architect, Bridgend.
" 2	Hastings—Cleaning and Painting	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings.
ROADS AND CARTAGE :			
Nov. 3	Alnwick—Tar Paving	Urban District Council	Urban District Council Offices, Green Bat.
" 3	Bexhill—Macadam	Borough Council	G. Ball, Borough Surveyor, Town Hall, Bexhill.
" 4	London, W.—Making-up, &c.	Paddington Council	E. B. B. Newton, Borough Surveyor, Town Hall, Paddington.
" 6	Beccles—Making-up, &c.	Town Council	T. O. Cudbird, Borough Surveyor, Beccles.
" 6	Settle—Streetmaking	Rural District Council	T. A. Foxcroft, Surveyor, Town Hall, Settle.
" 8	Potters Bar—Widening	Rural District Council	Mansbridge, Surveyor, 40 High Street, Barnet.
" 13	Mountain Ash—Street Works	Urban District Council	W. G. Thomas, Surveyor, Town Hall, Mountain Ash.
" 20	Gower—Road Widening, &c.	Rural District Council	T. Gordon Bowen, Surveyor, Penygraig, Penclawdd, R.S.O.
No date	Clewer—Asphalting	Parish Council	J. H. Strange, Clerk, 4 Victoria Street, Windsor.
"	Fairfield—Reconstruction of Street	Urban District Council	C. Flint, Surveyor, Terrace Road, Buxton.
SANITARY :			
Nov. 2	Kilkenny—Drainage Scheme	Guardians	Kieran Comerford, Clerk to the Guardians, Kilkenny.
" 3	Bildeston—Drain	Rural District Council	A. Newman, Clerk, Hadleigh, Suffolk.
" 6	Ewell—Removal of Refuse, &c.	Parish Council	G. Hards, Clerk, High Street, Ewell.
" 6	London, N.—Sewerage Works	Urban District Council	Surveyor, Church End, Finchley.
" 7	Willesden—Materials for Extension Precipitation Tanks	District Council	Council's Engineer, Dyne Road, Kilburn, N.W.
" 8	Featherstone—Sewerage and Drainage	Urban District Council	F. B. Rothera, Surveyor, District Council Offices, Featherstone.
" 8	Rochdale—Sewers, &c.	Town Council	S. S. Platt, Borough Surveyor, Town Hall, Rochdale.
" 9	Murton Colliery—Sewage-disposal Works	Rural District Council	C. Rule, Surveyor, Haswell, via Sunderland.
" 21	Winchcombe—Sewerage Works	Rural District Council	Willcox & Raikes, Engineers, 63, Temple Row, Birmingham.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
Nov. 4	Maesteg—Chapel	—	—	W. Job, Llynir Lodge, Maesteg, Wales.
" 4	Greenwich—Library	£25, £15, £10	—	F. Robinson, Town Clerk, Greenwich.
" 6	Luton—School and Technical Institution	—	—	W. W. Marks, Clerk to County Council, Shirehall, Bedford.
1905.				
Jan. 15	Hackney—Library	50, 30 and 20 guineas	£1 ts.	W. A. Williams, Town Clerk, Town Hall, Hackney.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

ADAMSEZ

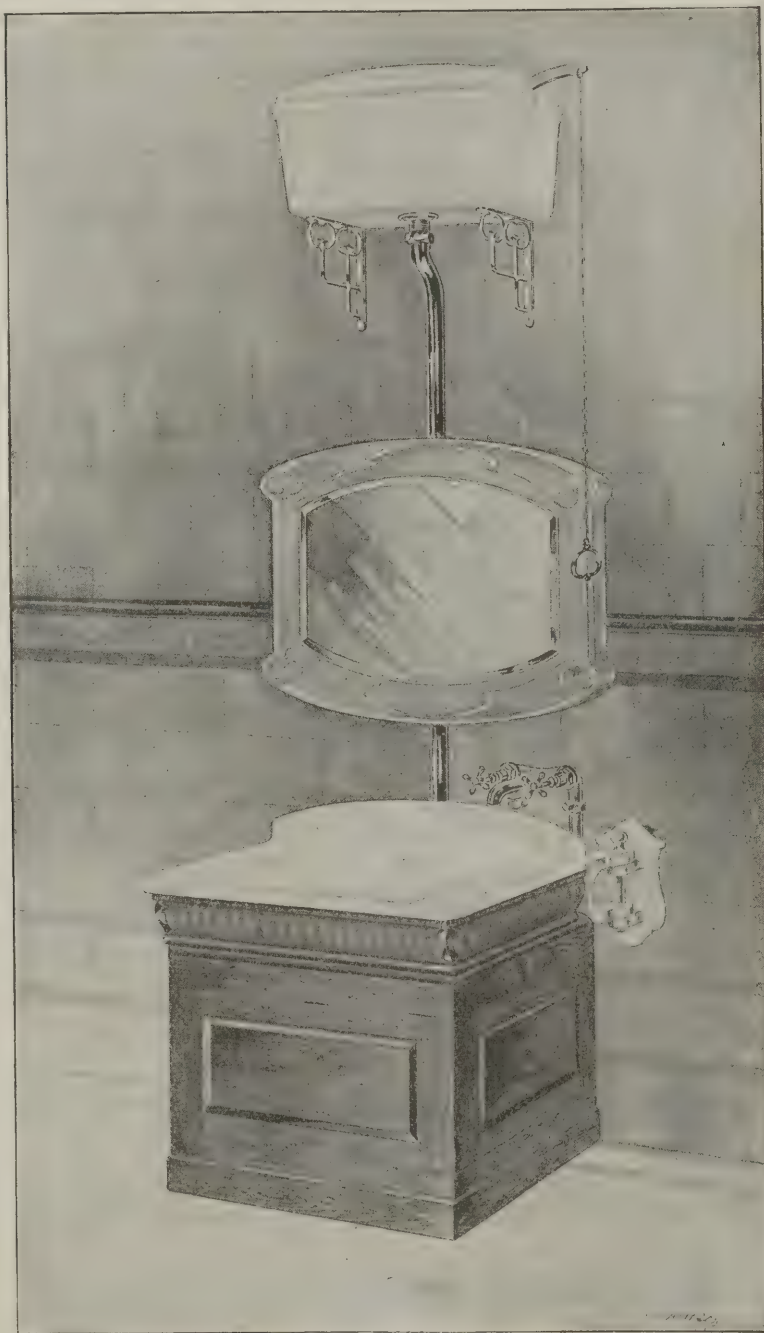
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Law Cases.

Right of Landlord to take away Tenant's Front Door.—At the Shoreditch County Court recently his Honour Judge Smyly, K.C., had to decide whether a landlord had the right to take away an obstinate tenant's front door. The case was *Aldridge v. Chastney*, and the facts were as follows:—The landlord had arranged with the tenant that the latter should quit the premises in question on June 24th last. The tenant, however, refused to quit. Thereupon, on July 3rd, the landlord's agent called upon the tenant to give up possession, which he refused to do. After some altercation the agent ordered his men to take away the front door of the premises, which was done. Upon this the tenant, in reply to a claim for rent, counterclaimed for damages for trespass and loss of goods stolen from his shop. Mr. Calvert, who appeared for the tenant, argued that this was a clear case of trespass. Mr. S. P. J. Merlin, counsel for the landlord, contended that a tenant was not entitled in law to bring an action of trespass under such circumstances. The landlord was the only person entitled to go on the premises after June 24th, and consequently he could do whatever he liked with the premises—take the roof off or take away the front door if he so chose—and the tenant, being nothing but a trespasser on the premises, had no right to maintain an action for trespass with regard to premises wherein he himself was a trespasser. After consideration of the authorities cited by counsel, the learned judge gave judgment for the landlord on both claim and counter-claim.

Coming Events.

Thursday, November 2.

CARPENTERS' COMPANY.—Dr. A. Wynter-Blyth on "The Sanitary Arrangements of Buildings, &c.—II." Carpenters' Hall, London Wall, at 7.30 p.m.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. Goodyear on "Architectural Refinements," at 8.30 p.m.
ARCHITECTURAL ASSOCIATION.—Conversazione.
THE CHEMICAL SOCIETY.—Ordinary Meeting at 8.30 p.m.

Friday, November 3.

GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Mr. R. Park on "Underpinning," at 8 p.m.
JUNIOR INSTITUTION OF ENGINEERS.—Mr. Dugald Clerk on "The Problem of the Gas Turbine," at 8 p.m.

Monday, November 6.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. A. Needham Wilson on "Sketch Plans and Working Drawings."
SOCIETY OF ENGINEERS.—Mr. Sherard Cowper-Coles, A.M.I.C.E., M.I.M.E., on "The Metallic Preservation and Ornamentation of Iron and Steel," at 7.30 p.m.

Monday, November 13.

SURVEYORS' INSTITUTION.—General Meeting at 8 p.m.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending October 27th twenty-four failures in the building and timber trades in England and Wales were gazetted.

F. PURSER, plumber, Leicester. Deficiency £266.
 EVANS & ROBERTS, builders and contractors, Brynamman. Adj. Oct. 19th.
 D. THOMAS & SON, builders and contractors, Cardiff. Deficiency £1,176.
 J. HARLEY & SON, builder, Smethwick. Deficiency £6,678.
 G. BROWN, builder and contractor, Great Witchingham. Deficiency £370.
 R. ALLEN, plumber, Leeds. P.E., Leeds C.C., Nov. 14th, at 11.
 A. L. GENLOND, architect, Cherryhinton. R.O. Oct. 21st.
 C. MITCHINSON, plumber, Bishop Auckland. Adj. Oct. 19th.
 J. A. CRAIG, builders' material merchant, Southend-on-Sea. P.E., Shirehall, Chelmsford, Nov. 1st, at 10.
 TIMSON & ADAMS, builders' merchants and contractors, Leicester. R.O. Oct. 21st.
 W. BRIGGS, plumber, Leeds. First meeting, O.R.'s, Leeds, Nov. 1st, at 12. P.E., Leeds C.C., Nov. 14th, at 11.
 T. ELLISON, builder, Gomersal. First meeting, O.R.'s, Dewsbury, Nov. 1st, at 11. P.E., Dewsbury C.C., Nov. 7th, at 2.
 W. C. BROADHURST, builder and contractor, Stockport. First meeting, O.R.'s, Stockport, Nov. 3rd, at 11. P.E., Stockport C.C., Nov. 8th, at 11.
 RAYNER & CO., tile and brick makers, Runwell and Galleywood Common. P.E., Shirehall, Chelmsford, Nov. 1st, at 10. First meeting, same, at 3.
 P. S. HOWARD, builder, Charlton. First meeting, 24, Railway Approach, London Bridge, S.E., Nov. 2nd, at 11.30. P.E., Greenwich C.C., Nov. 14th, at 1.
 C. C. CROWE & CO., timber and builders' material merchants, Tottenham and Kensal Rise. P.E., Edmonton C.C., Nov. 27th, at 11.30.
 G. W. GREGORY, builder, Sutton-in-Ashfield. First meeting, O.R.'s, Nottingham, Nov. 1st, at 12. P.E., Nottingham C.C., Nov. 3rd, at 10.
 M. MORLEY, architect and surveyor, Wellington. First meeting, Charlton Hotel, Wellington, Nov. 4th, at 12.30. P.E., Madeley C.C., Nov. 15th, at 11.30.
 H. OSWIN, builder, Walsall. First meeting, O.R.'s, Wolverhampton, Nov. 2nd, at 11.30. P.E., Walsall C.C., Nov. 29th, at 11.30.
 J. N. DAWSON, builder, Great Yarmouth. First meeting, O.R.'s, Norwich, Nov. 4th, at 12. P.E., Great Yarmouth Town Hall, Nov. 7th, at 11.
 J. HALLETT, builder, Sutton. First meeting, 24, Railway Approach, London Bridge, S.E., Nov. 1st, at 11.30. P.E., Croydon C.C., Dec. 7th, at 11.
 H. MARTER, builder, Kingston-on-Thames. First meeting, 24, Railway Approach, London Bridge, S.E., Nov. 3rd, at 12. P.E., Kingston C.C., Dec. 12th, at 2.30.
 HAND BROTHERS, plumbers and decorators, King's Norton. First meeting, 191, Corporation Street, Birmingham, Nov. 2nd, at 12. P.E., Birmingham C.C., Nov. 27th, at 2.
 G. YEOMANS, builder and contractor, Farnborough. First meeting, 24, Railway Approach, London Bridge, S.E., Nov. 3rd, at 12.30. P.E., Guilford Town Hall, Nov. 7th, at 1.

New Companies.

T. W. POUNDER AND SONS, LTD., plumbers, glaziers, &c., West Hartlepool. Capital: £4,000.
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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

C Coventry.—Accepted for extensions at the infirmary, for the Guardians:—

A. A. Wincott £6,700

Halberton.—For taking down and rebuilding farmhouse at Halberton Court, Devon, for Mr. Robert Pearce Elworthy, Mr. William Barrons, architect, Deepway, Tiverton:—

Tucker, Parr & Pincott, Tiverton ... £1,651 0 0
 J. Grater & Sons, Tiverton ... 1,524 0 0
 R. Hill & Son, Cullompton ... 1,440 0 0
 R. Grater & Sons, Tiverton ... 1,438 0 0
 E. Labdon & Sons, Cullompton ... 1,400 0 0
 S. Manning, Tiverton ... 1,195 0 0
 H. Nott & Son, Bampton ... 1,189 0 0
 Nicks Brothers, * Cullompton ... 1,135 17 6

* Accepted.

London, E.—For the erection of nurses' home, for the Mile End Board of Guardians:—

Hewett, Barking ... £8,750 0 0
 Brown, Mile End ... 8,407 10 0
 E. Jackson, Stepney ... 8,262 7 0
 Gladding, Whitechapel ... 7,927 0 0
 Porter, Tottenham ... 7,520 0 0
 Roberts, Islington ... 7,496 0 0
 Sharp, Stratford ... 7,493 0 0
 Harris, Barnsbury ... 7,375 0 0
 Webster, Peckham Rye ... 7,335 0 0
 Pierce, Thornton Heath ... 7,300 0 0
 Harris & Wardrop, Limehouse ... 7,277 0 0
 Mile & Upson, Clackton ... 7,249 0 0
 Lawrence, Tottenham ... 7,244 0 0
 Moss, Southend ... 7,200 0 0
 Stapleton, Stoke Newington ... 7,200 0 0
 Turnbull, Fenchurch Street ... 7,198 0 0
 Evans, Peckham ... 7,138 0 0
 Symes, Stratford ... 7,100 0 0
 Steadman, Forest Gate ... 7,021 0 0
 Almond, Ponders End ... 6,985 0 0
 Lamplow, Notting Hill ... 6,981 0 0
 Yates, Bow ... 6,953 0 0
 Chesham, Bow ... 6,899 10 0
 Coxhead, Leytonstone ... 6,840 0 0
 Hammond, Romford ... 6,660 0 0
 Hyde, Norwood Junction ... 6,644 0 0
 Holliday, * Commercial Road ... 6,260 0 0

* Accepted.

London, S.E.—For pulling down and rebuilding bank premises, 56 and 58, Old Kent Road, S.E., for the London and Provincial Bank. Mr. V. Vagnolini, architect, 33, Stirling Road, Clapham Rise, S.W.:—

G. J. Kick ... £2,546 18 0
 W. S. Shepherd ... 2,310 0 0
 A. Faulds ... 2,222 0 0
 Edwards & Medway ... 2,146 0 0
 Rice & Son ... 1,992 0 0
 J. Parsons* ... 1,887 0 0

* Accepted.

Norwich.—For extensions of City Asylum. Mr. A. E. Collins, M.I.C.E., city engineer:—

J. S. Smith ... £9,547 0 0
 T. H. Blyth, Foulsham, Norfolk ... 9,280 16 0
 R. Daws ... 9,255 15 0
 Coulson & Lofts, Cambridge ... 9,249 0 0
 T. H. Gill ... 8,977 16 7
 A. S. Lincoln ... 8,899 12 7
 S. W. Utting ... 8,797 0 0
 Gunton & Palmer, Cossey, near Norwich ... 8,794 1 0
 Youngs & Son ... 8,698 0 0
 Boddy & Son ... 8,683 4 2
 H. C. Greengrass† ... 8,667 0 0
 W. J. Hannant* ... 8,211 0 0
 Southgate Brothers† ... 8,026 19 9
 Downing & Son ... 7,905 0 0

[Rest of Norwich.]

* Accepted. † Informal. ‡ Incomplete.

|| Withdrawn.

(Continued on p. xvi.)

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ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT (21) seeks situation. London office. Good draughtsman. Detail and small scale drawings. 4 years' general experience. Good references. Moderate salary.—R. F. D., 4, Buckland House, Offord Rd., N. 1452

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THE QUANTITY SURVEYORS' ASSOCIATION.

(INCORPORATED.)

A PRELIMINARY EXAMINATION for the admission of Students of the above Association, and a DIRECT FINAL EXAMINATION qualifying for Membership, will be held in APRIL 1906.

Applicants must send in their names for approval by the Council on Forms which (together with the Syllabus) may be obtained from the undersigned, on or before the 30th day of NOVEMBER, 1905.

F. B. HOLLIS, Hon. Sec.,
October, 1905. 17, Bedford Row, London, W.C.

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Competitions Open.

THE BEDFORDSHIRE COUNTY COUNCIL invite Architects willing to compete in a limited COMPETITION for a new Secondary School and Technical Institution, proposed to be erected in Park Square, Luton, to submit their names to the undersigned before MONDAY, November 6th, 1905.

The Education Committee in whose hands the matter has been placed by the Council have appointed Mr. H. Percy Adams, F.R.I.B.A., to adjudicate upon the designs of the selected architects (probably seven), and the author of the design chosen by him will be employed to carry out the work and be paid in accordance with the schedule of charges sanctioned by the Royal Institute of British Architects.

To the unsuccessful selected architects an honorarium of £10 each will be paid provided they submit a bonâ fide competitive design.

The cost of the buildings is not to exceed the sum of £6,000.

W. W. MARKS,
Shire Hall, Bedford. Clerk of the County Council.

Contracts Open.

ESSEX EDUCATION COMMITTEE.

BRAINTREE ADVISORY SUB-COMMITTEE.

TO BUILDERS AND JOINERS.

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A plan of the site to be fenced may be seen at, and a copy of the specification obtained from, the office of the undersigned.

Sealed Tenders, endorsed "Jarrah Wood Fence," must reach me not later than WEDNESDAY, 8th NOVEMBER, 1905.

The Committee do not bind themselves to accept the lowest or any Tender.

JOHN GLEAVE,
Clerk to the Braintree Advisory Sub-Committee.
Hollywood,
Braintree,
21st October, 1905.

GLOUCESTER EDUCATION COMMITTEE.

TO BUILDERS AND CONTRACTORS.

Builders desirous of TENDERING for the ERECTION of COUNCIL SCHOOLS in Derby Road, Gloucester, are requested to send their names to the Architect, Mr. J. Fletcher Trew, M.S.A., County Chambers, Station Road, Gloucester, not later than the 1st NOVEMBER next, between the hours of Ten and Five, at whose office the plans and specifications may be seen.

Bills of quantities may be obtained from Messrs. Vale & Kingsford, George Street, Gloucester, on deposit of £5 note, which will be returned on receipt of a bonâ fide Tender with the return of all papers supplied.

Sealed Tenders are to be sent in to the undersigned not later than NOON on TUESDAY, NOVEMBER the 21st next, endorsed "Tender for Derby Road Council Schools, Gloucester."

The Committee do not bind themselves to accept the lowest or any Tender.

P. BARRETT COOKE,
5, Berkeley Street, Gloucester. Secretary,
City of Gloucester Education Committee.

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1468.—QUANTITIES, estimates, variations, &c. prepared by surveyor; London exp.

See p. xx for the Employment Register.

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TENDERS—cont. from p. xiii.

Norton (Hereford).—For the erection of a farmhouse and buildings at Meeting House Farm, for Sir Powlett C. J. Milbank, Bart. Mr. James Taylor, architect, Exchange Chambers, Hereford:—

R. Morgan, Kingston ...	£1,658	4	0
B. A. Hamer, Kingston ...	1,407	5	8
Davies & Co., Hereford ...	1,402	8	9
R. L. Friend, Hereford ...	1,287	0	0
W. Cadwallader, Knighton ...	1,047	0	6
Mantle & Griffiths,* Norton ...	1,045	0	0

* Accepted.

Northwich.—For the erection of Victoria Road Council school, to accommodate 800 children; also for making two new streets off Victoria Road, and a back passage, Mr. A. E. Powles, architect, 7, Winnington Street, Northwich:—

W. Molyneux, Northwich ...	£12,936	0	0
S. Webster, Bootle ...	12,777	0	0
Pickstock & Royle, Holmes Chapel ...	12,764	12	0
T. G. Huxley, Malpas ...	12,700	0	0
E. W. Bostock, Northwich ...	12,535	0	0
S. Appleton, Winnington ...	12,172	10	0
P. Taylor & Sons, Northwich ...	11,857	0	0
Bennett Brothers, Burslem ...	11,600	0	0
Young, Tinker & Young, Manchester ...	11,597	0	0
E. W. Bostock, Northwich ...	12,535	0	0
J. Mayers & Son, Chester ...	11,530	0	0
J. Gerrard & Sons, Swinton ...	11,526	0	0
C. W. Davenport, Stockton Heath ...	11,387	0	0
W. Wood,* Hartford ...	11,320	0	0
Hughes & Stirling, Bootle ...	11,258	0	0
J. Hamilton & Son, Altrincham ...	11,233	0	0

* Accepted.

Oxford.—For the erection of six houses in Lonsdale Road, for Mr. Francis Twining. Mr. Frank Mountain, architect and surveyor, Oxford:—

J. Simms & Son ...	£3,098
T. H. Kingerlee & Sons ...	3,060
S. Hutchins & Son ...	2,980
W. Gray ...	2,740
N. Capel & Sons*	2,570

* Accepted.

Oxford.—For the erection of additional students' rooms, library, chemical laboratories and lecture-rooms, Ship Street, for Jesus College. Messrs. R. England & Son, architects and surveyors, Oxford:—

Synn & Co. ...	£15,563
Hutchins & Sons ...	15,200
Parnell & Son ...	14,863
Kingerlee & Sons ...	14,367
J. Woodbridge ...	13,850
Benfield & Loxley ...	13,824
Estcourt & Sons,* Gloucester ...	13,656

* Accepted.

Oxford.—For the erection of a pair of houses in Lathbury Road, for Mr. Francis J. Andrews. Mr. Frank Mountain, architect and surveyor, Oxford. Quantities by the architect:—

Organ Brothers ...	£2,170	11	0
Brucker Brothers ...	2,106	0	0
J. Woodbridge ...	1,922	0	0
J. Simms & Son*	1,890	10	0

* Accepted.

[All of Oxford.]

Rushden.—For the erection of new Council offices in Newton Road, for the Urban District Council. Mr. W. B. Madin, C.E., surveyor:—

T. Wilmoth, Rushden ...	£2,697	0	0
T. Hickman, Market Harborough ...	2,568	0	0
Harrison & Winsor, Rushden ...	2,566	10	0
Whittington & Tomlin, Rushden ...	2,535	0	0
Brown & Son, Wellingborough ...	2,520	0	0
C. E. Bayes, Rushden ...	2,499	0	0
W. Packwood, Rushden ...	2,497	16	0
Hacksley Brothers, Wellingborough ...	2,490	0	0
Berrill & Green, Wellingborough ...	2,460	0	0
Kettering Co-operative Builders ...	2,411	0	0
Goodman & Murkett, Wellingborough ...	2,395	0	0
R. Marriott,* Rushden ...	2,365	0	0

[Surveyor's estimate, £2,497.]

* Accepted subject to Council obtaining sanction from Local Government Board to a loan for carrying out the works.

St. Albans.—For the erection of a residence in Hall Place Gardens, for Mrs. Langridge. Mr. H. F. Mence, architect, Town Hall Chambers, St. Albans:—

E. Dunham ...	£1,566
C. Miskin & Sons,* St. Albans ...	1,558

* Accepted.

St. Albans.—For the erection of six cottages, for the Trustees of St. Peter's Charities. Mr. H. F. Mence, architect, Town Hall Chambers, St. Albans. Quantities by Mr. W. H. Smith, 5, Great Winchester Street, E.C.:—

H. J. Skelton ...	£2,690
C. Miskin & Sons ...	2,545
J. Jarvis & Sons ...	2,396

* Accepted.

Belfast.—For (1) building and completing two annexes, with baths, water-closets, &c., at the infirmary; and (2) at the infirm departments (female side); (3) the carrying out of sundry alterations and improvements at the fever hospital; and (4) for the erection of a new lavatory, water-closets, shelter or porch, the lengthening of boiler flue, removing exhaust cistern, putting roof lights over kitchen, and fitting up hot-water supply to kitchen at the infirmary department of the workhouse, for the Guardians:—

	Infirmary annexe.	Infirmary department annexe.	Hospital alterations.	Lavatory and water-closets at infirmary.
J. Louden & Co. ...	£1,699	0	0	£369
T. McMillan ...	1,539	10	0	322
Campbell & Son ...	1,485	0	0	344
J. & W. Stewart ...	1,485	0	0	330
J. Kidd ...	1,418	0	0	320
Thornbury Brothers ...	1,371	18	0	298
H. & J. Martin ...	1,348	3	9	287
McRoberts & Armstrong ...	1,325	10	0	330
W. Dowling ...	1,324	0	0	296
H. Keith*	1,250	0	0	279

* Accepted.

[All of Belfast.]

Vail & Williamson ...	£2,379
Boff Brothers ...	2,376
F. W. Stanley ...	2,284
J. Foot ...	1,889
E. Dunham ...	1,644
J. Hammond & Sons,* St. Albans ...	1,610

* Accepted.

Swansea.—For the construction of underground conveniences in Alexandra Road, for the Corporation. Mr. G. Bell, borough surveyor:—

W. H. Michael & Co. ...	£1,750
T. Richards ...	1,600
W. Harding ...	1,527
J. Williams ...	1,525
J. Marles & Son ...	1,522
J. & D. Jones ...	1,470
Mellows & Co., Sheffield ...	1,448
Winkle & Co., London ...	1,399
D. Jenkins & Co. ...	1,385
Bennett Brothers,* Heathfield Yard ...	1,348

[Borough surveyor's estimate, £1,470.]

* Accepted. [Rest of Swansea.]

Warrington.—Accepted for the erection of a public elementary school, to be known as the Beaumont Council School, for the Sites and Buildings Committee:—

C. W. Davenport, Stockton Heath, Warrington ...	£13,784	10	0
-------------------------------------------------	---------	----	---

Wolverton.—For the erection of girls' and infants' school to accommodate 820 children, and also cookery centre, for the Bucks County Education Committee. Messrs. Harrington, Ley & Kirkham, architects, 65, Bishopsgate Street Without, E.C. Quantities by Messrs. W. T. Farthing & Son, 46, Strand, W.C.:—

G. Tombs & Sons, Buckingham ...	£10,426	12	6
F. Wood & Co., Luton ...	10,178	0	0
J. Barker & Co., Kensington ...	9,953	0	0
W. J. Bloxham, Banbury ...	9,935	0	0
Sturgess & Son, Road, Northants ...	9,800	0	0
W. E. Bennett, Plymouth ...	9,402	0	0
W. J. Dickens, Ealing ...	9,250	0	0
J. Parnell & Son, Rugby ...	9,240	0	0
A. J. Colborne, Swindon ...	8,769	17	7
Coulson & Lofts, Cambridge ...	8,755	9	0
H. Martin, Northampton ...	8,780	0	0
C. H. Hunt & Son, High Wycombe ...	8,773	0	0
A. P. Hawtin, Northampton ...	8,772	0	0
G. Henson & Son, Wellingborough ...	8,728	0	0
A. W. Nash, Dunstable ...	8,685	0	0
W. Heap, Lea Road, Northampton ...	8,680	0	0
G. H. Gibson, High Wycombe ...	8,584	0	0
J. Honour & Son, Tring ...	8,495	0	0
Parren & Son, Earith, Hunts ...	8,493	0	0
T. Hickman, Market Harborough ...	8,437	0	0
W. Moss & Sons, Loughborough ...	8,417	0	0
C. Wright, Leicester ...	8,150	0	0
Co-operative Builders, Kettering ...	8,006	4	0
E. Archer,* Central Joinery Works, Northampton ...	7,846	0	0

* Accepted subject to a proper contract being executed and to the Local Government Board sanctioning the loan.

Wolverton.—For the erection of new secondary school for about 165 children, for the Bucks Education Committee. Messrs. Harrington, Ley & Kirkham, architects, 65, Bishopsgate Street Without, E.C. Quantities by Messrs. Farthing & Son, 46, Strand, W.C.:—

F. Wood & Co., Luton ...	£5,660	0	0
T. Yirrell, Leighton Buzzard ...	5,595	0	0
W. J. Bloxham, Banbury ...	5,586	0	0
A. J. Colborne, Swindon ...	5,559	0	0
Martin, Wells & Co., Vauxhall, S.E. ...	5,499	0	0
S. Page & Son, Croydon ...	5,460	0	0
A. J. Chown, Northampton ...	5,030	0	0
Coulson & Lofts, Cambridge ...	4,996	0	0
W. J. Sturgess & Son, Road, Northampton ...	4,915	15	6
G. Tombs & Sons, Buckingham ...	4,900	0	0
G. Henson & Son, Wellingborough ...	4,838	0	0
T. Stimson, Wokingham ...	4,741	0	0
A. P. Hawtin, Northampton ...	4,629	0	0
C. Wright, Leicester ...	4,619	0	0
H. Martin, Northampton ...	4,580	0	0
C. H. Hunt & Son, High Wycombe ...	4,573	0	0
G. J. Fisher, Northampton ...	4,560	0	0
E. Archer, Northampton ...	4,543	0	0
J. Parren & Son, Earith ...	4,532	3	0
A. Nash, Dunstable ...	4,525	0	0
W. Higgins, Northampton ...	4,485	0	0
Hacksley Brothers, Wellingborough ...	4,449	0	0
W. Heap, Northampton ...	4,399	0	0
Co-operative Builders, Kettering ...	4,350	0	0
E. Green,* 24, Palmerston Road, Northampton ...	4,088	0	0

* Accepted at £4,088 for erection of the building and £135 for front boundary walls, subject to proper contract being entered into and to the county council approving an additional loan of £750 and the sanction of the Local Government Board being obtained to the necessary loan.

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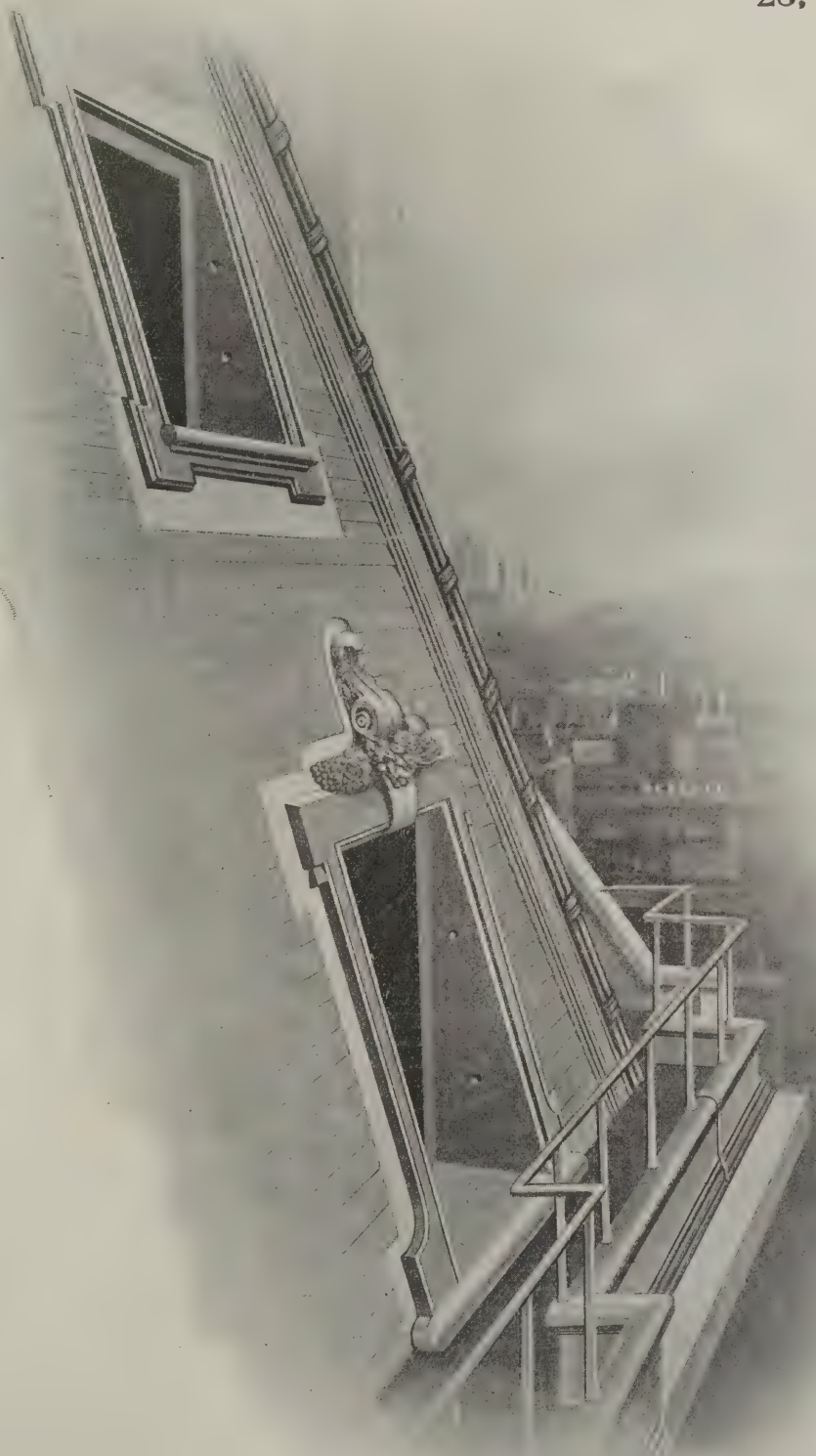


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				£	s.	d.	£	s.	d.
Beans	per qr.	1	10	0	1	12	0
Clover, best	per load	3	12	0	4	0	0
Hay, good	do.	3	5	0	3	10	0
Sainfoin mixture	...	...	do.	3	7	0	3	15	0
Straw	...	...	do.	1	10	0	1	16	0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1	3	11	1	6	3
Colza Oil, English ...	do.	1	4	3	—	—	—
Copperas	per ton	2	0	0	—	—	—
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate ...	per ton	16	0	0	—	—	—
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	0	17	7½	—	—	—
Petroleum, American ...	per gal.	0	0	6½	0	0	6½
Do. Russian	do.	0	0	6½	0	0	6½
Pitch	per barrel	0	8	0	—	—	—
Shellac, orange	per cwt.	8	17	6	—	—	—
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	6	3	1	6	6
Tar, Stockholm	per barrel	1	5	0	—	—	—
Turpentine	per barrel	2	11	0	—	—	—

METALS.

Copper, sheet, strong ...	per ton	86	0	0	—	—	—
Iron, Stuffs, bar	do.	6	10	0	8	0	0
Do. Galvanized Corrugated sheet ...	do.	11	15	0	12	5	0

Lead, pig, Soft Foreign...	per ton	£	s.	d.	£	s.	d.
Do. do. English common brands	do.	15	6	3	—	—	—
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	17	0	0	—	—	—
Do. pipe	do.	17	10	0	—	—	—
Nails, cut clasp, 3in. to 6in. ...	do.	9	5	0	—	—	—
Do. floor brads... ..	do.	9	0	0	—	—	—
Steel, Stuffs, Girders and Angles	do.	6	5	0	6	12	6
Do. do. Mild bars	do.	6	5	0	6	10	0
Tin, Foreign	do.	148	15	0	149	5	0
Do. English ingots	do.	151	0	0	152	0	0
Zinc, sheets, Silesian ...	do.	31	7	6	—	—	—
Do. do. Vieille Montaigne ...	do.	31	10	0	—	—	—
Do. Spelter	do.	28	10	0	28	15	0

TIMBER.

Soft Woods.

Fir, Dantzic and Memel ...	per load	4	12	6	5	0	0
Pine, Quebec, Yellow ...	do.	4	0	0	7	10	0
Do. Pitch, American ...	do.	3	3	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, Soderhamn, Yellow, 3rd, 4x11 ...	per std.	14	0	0	—	—	—
Do. do. do. 3rd, 2½x7 ...	do.	10	0	0	—	—	—
Do. Halifax (N.S.), Hemlock, 4x9 ...	do.	6	0	0	—	—	—
Do. St. Petersburg, White, Unsorted, 3x11 ...	do.	9	5	0	—	—	—
Do. do. do. do. 3x9 ...	do.	9	0	0	—	—	—
Do. do. do. 3rd, 2½x7 ...	do.	7	15	0	—	—	—

Deals, St. Petersburg, White, Unsorted, 3rd, 2½x7 ...	per std.	8	0	0	—	—	—
Do. do. Yellow, Unsorted, 2½x7 ...	do.	8	10	0	—	—	—
Do. Archangel, Yellow, 5th, 3x9 ...	do.	6	10	0	—	—	—
Do. do. White, 2nd, 3x9 ...	do.	9	5	0	—	—	—
Do. Petschora, Yellow, 3rd, 3x9 ...	do.	8	5	0	—	—	—
Do. Norsundent(Gefle), Yellow, 5th, 3x4 ...	do.	5	15	0	—	—	—
Do. Christiania, Yellow, Unsorted, 3x4 ...	do.	6	10	0	—	—	—
Do. Yxpila, Yellow, 1st and 2nd, 2½x7 ...	do.	8	0	0	—	—	—
Battens, all kinds ...	do.	6	15	0	13	0	0
Flooring Boards in, prepared, 1st... ..	per square	0	9	9	0	10	9
Do. 2nd	do.	0	8	6	0	10	0
Do. 3rd, &c.	do.	0	8	9	0	9	6

HARD WOODS.

Ash, Quebec	per load	4	0	0	7	10	0
Birch, New Brunswick... ..	do.	2	0	0	4	5	0
Do. Quebec do.	do.	2	5	0	4	10	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	4½	—	—	—
Do. Honduras	do.	0	0	3½	0	0	4
Do. Tobasco	do.	0	0	5	—	—	—
Elm, Quebec	per load	4	5	0	8	10	0
Jarrah, plank	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras... ..	per ft. sup.	0	0	5½	—	—	—
Do. Tobasco	do.	0	0	3½	0	0	6
Do. Cuba	do.	0	0	4½	0	0	6½
Do. African	do.	0	0	3½	—	—	—
Oak, Wainscot	per log.	3	0	0	7	0	0
Teak, Indian, logs	per load	9	15	0	19	0	0
Do. do. planks	do.	12	15	0	20	10	0
Whitewood, American, logs.	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0



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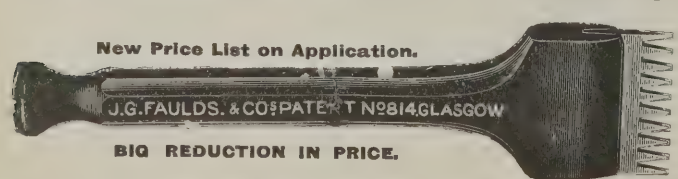
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THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

November 8, 1905. Vol. 22, No. 561.

6, Great New Street, Fetter Lane, E.C.

Summary.

In his presidential address to the Institute on Monday night Mr. Belcher said the council, after many enquiries, were now prepared to recommend the acquisition of a fine freehold site in Portland Place for a new official home of the Institute. With regard to registration he said that the committee appointed by the general body had suggested a form of Bill, but as considerable diversity of opinion still existed it was scarcely possible that the Bill would pass into law. On the question of education and the new board he announced that some twelve well-known architects had intimated that they were now willing to join the Institute and work with it. (Pages 272 and 273.)

The Gladstone Memorial in the Strand was unveiled on Saturday. (Page 270.)

The City Corporation decided last Thursday to promote a Bill in Parliament for widening Blackfriars Bridge and to construct a subway for foot passengers under the roadway at the northern end. (Page 270.)

Messrs. Spencer, Santo & Co., Ltd., declare an interim dividend of 8 per cent. per annum on their ordinary shares. (Page 270.)

Within the past few years New York has been building a number of public baths, the plan adopted being a combination of shower baths and a swimming bath. It is an essential part of the scheme that bathers shall use the former before going into the latter. (Page 263.)

As a solution of the difficulty of future interments in Westminster Abbey Mr. Bodley suggests that the space in Dean's Yard should be treated after the manner of the "Campo Santo" at Pisa. (Page 270.)

The London wood market may be said to have improved all round during October, though the volume of demand was not all that could be wished. The import of teak continues to be small, and it is matter for consideration that Java wood constituted one-half of the import last month—wood from a Dutch possession thus taking the place of Indian teak. The Liverpool market is in a fairly active condition. (Pages 268 and 269.)

An amusing case concerning a pupil articled to a Bradford architect was heard last week. For the pupil it was contended that he was not being taught the details of his profession, while the architect counter-claimed for damage done to office furniture, and misdemeanour. (Page 271.)

In a case concerning the employment of day labourers heard at Manchester last week the stipendiary gave a verdict in their favour on the ground that, as they were told to "stand down" and afterwards kept waiting, they had a right to be paid their wages at once, or be compensated for the time they were kept waiting. (Page 271.)

A "little palace" has been discovered at Knossos, and a new type of column with fluting in relief has been found there. (Page 274.)

Two more Unsatisfactory Competitions.

OUR leader in last week's issue on the subject of competitions has excited considerable interest. We are proceeding with our arrangements for obtaining early and full information regarding competitions, and shall be glad if readers will forward any news that reaches them, so as to assist in remedying abuses to which we have called attention, abuses which are a blot upon architectural practice. We pointed out how the press and the architectural public are advisedly kept ignorant by the promoters of these doubtful competitions. No opportunity is given to get at the facts. We have just found another instance, namely, that of the Elgin cemetery extensions competition. Upon applying for a copy of the conditions and the names of the winners, and as to whether the designs would be on exhibition, so that we might have the opportunity of criticizing them, we received a reply from the solicitors to the committee stating that the prize has been awarded to a local architect, Mr. William C. Reid, and that his design was under consideration with a view to alterations; and the significant remark was added that they did not think that the committee would care to have it criticized. The conditions have not been furnished to us, nor is there any statement that any public exhibition of the designs was held. We must point out to the promoters that their action leaves them open to the gravest suspicion, because other competitions have been unfairly promoted, the work being handed over to a local architect friendly with the promoters and his design modified in accordance with the suggestions obtained from the designs submitted by other competitors, these ideas being filched without any remuneration. We cannot say whether this is the case in the Elgin competition, because no opportunity is afforded to come to a judgment upon the merits of the case, nor is any information vouchsafed as to the conduct of this competition. No assessor appears to have been appointed; where a professional assessor is engaged competitors have the satisfaction of knowing that their designs have been judged by a person qualified to do so. Another unsatisfactory instance comes from Dartmouth. The "Exeter Flying Post" states that over forty plans have been sent in for the new municipal buildings, and these the committee have reduced to three. Our contemporary sagaciously remarks: "How many of the committee are competent to judge which comes within the mark of £7,000? There are on the council a coal merchant, two outfitters, a tailor, a retired draper, a publican, a sailmaker, a builder, a farmer, two shoemakers, an engineer and a butcher.

It cannot be expected that, with two exceptions, they have any knowledge enabling them to decide which plan would be the best and cheapest for the town." This is typical of the unfair conduct of many competitions. We trust that the local press and other guardians of the public honour, however, will see that any moral injustice is brought home to those responsible.

Overloading of Floors.

THE sad fatality that occurred at Burslem last week, when a girl was killed by the collapse of a warehouse floor, comes as another warning against the dangerous and ignorant practice of loading floors without any investigation or understanding of their strength. Buildings are often used for purposes for which they were never designed, and are loaded with heavy weights without anyone consulting an architect or engineer as to the safety of doing so. Public officials ought to attend to this matter, but they do not, and, as a consequence, accidents frequently occur. This particular one occurred at the factory of the Rhodes Tile Co., Ltd., in Reginald Street, Burslem. The building was of two floors, the upper floor being used for storing tiles, and the lower, or ground floor, as a workshop, about a dozen persons being there engaged. A considerable weight of tiles was stored on the first floor, and one of the walls of the premises had recently shown signs of bulging and was strengthened by an iron rod bolted on a stout beam. Without any warning the upper floor collapsed and crashed into the shop below, killing one girl and severely injuring another, and also slightly injuring a man. The warning which was given by the bulging of the wall should have been attended to. The strengthening by means of the bolt was evidently insufficient, and those responsible should have known that this method was inadequate. We have noticed on many occasions how floors are similarly overloaded in buildings used as factories or warehouses. Printers in particular are careless in regard to this matter. It is true the buildings in which they work have generally been designed as warehouses, but seldom were they intended for printing works, and the heavy distributed and the very great concentrated loads were unrealized by their designers. We have often seen type piled up to a great height on floors and staircases. It is lucky that there is a large factor of safety, for if it were not for this there would be accidents. The absolute ignorance displayed in this respect is remarkable, and as the owners and workpeople seem unable to take care of themselves it should be the duty of public officials to see that no danger arises.

CURVES IN CLASSIC ARCHITECTURE.

Not Optical Refinements.

IN his third lecture on architectural refinements, at Edinburgh, Mr. W. H. Good-year dealt with the refinements present in the buildings of Classic Greece. He said that the popular explanation that the Greek curves in elevation were intended to correct a sagging effect in a long horizontal line had no authority to support it, although it appeared to be making its way into popular compendiums. Penrose never suggested such an explanation, nor had it been suggested by any other standard authority. Neither Hoffer, Thiersch, Hauck, Burckhardt, Kugler, Schnaase, Boutmy nor Burnouf ever suggested such an explanation. Experts in curvilinear perspective asserted an exactly contrary appearance. A horizontal line curved optically upward when seen above the level of the eye. It curved optically downward only when seen below the level of the eye. What Penrose suggested was an entirely different matter, namely, that there was a sagging effect of a horizontal line under a gable. This was true, but it did not account for the curves on the flanks. Therefore the explanation of Penrose had been universally rejected or ignored by Continental authorities. Thiersch and Hauck had also shown that the explanation of Penrose did not even meet the problem of the curve in the stylobate under the gable. The stylobate was supposed by Penrose to have been curved to harmonize with the entablature, but as long as the curve of the entablature under the gable was conceived by Penrose as simply correcting an optical sagging, the entablature would, on this theory, appear straight, and consequently there would be no occasion to curve the stylobate for reasons of harmony.

Mr. Goodyear next pointed out that the theories of optical correction which had been advanced by Thiersch and Hauck (which he explained in detail) were undoubtedly advanced on the theory of Penrose, but as they were formulated in ignorance of the curves in plan in the temple of Medinet Habou they were discounted by this very simple circumstance. The existence of these Egyptian curves was not made known to the world until 1878, although they were discovered by Pennethorne in 1832, in advance of his discoveries of the curves of the Parthenon.

The only optical expert who had published on the curve since 1878 was Guido Hauck. His work appeared in 1879, and he was not aware of Pennethorne's publication of the previous year.

Thus Mr. Goodyear explained that the theories of optical correction for the Greek curves must be considered as out of date. They had never figured in the publications of the great German authorities on the history of art, such as Burckhardt, Kugler and Schnaase. These authors had considered the sentiment of beauty a sufficient explanation, and as Penrose himself had mentioned "the beauty inherent in a curved line" as a concurrent explanation for the curves on the flanks it might be safely accepted as a theory satisfactory to all parties. The theory that the Greek curves were intended to build in effects of curvilinear perspective, in harmony with and accenting the rising curves which all horizontal lines above the level of the eye optically presented under normal circumstances, was not to be neglected. This theory was advanced by Hoffer in 1838, and his publication long preceded that of Penrose in 1851. But Hoffer again insisted on the sentiment of beauty as a concurrent cause. In 1870 Boutmy again developed the perspective theory, but once more accentuated the sentiment of beauty. The Egyptian curves in plan might come under both explanations. No one except the editor of the "Builder" had

ever suggested that they were optical corrections.

The curves in plan on the flanks of the temple of Neptune at Paestum were announced by Jacob Burckhardt. The curves in plan of the Maison Carrée at Nîmes were announced by the lecturer in 1895. These curves could not be brought under any theory of optical correction that had ever been advanced by a standard authority on optics.

The general argument of the lecture was, therefore, that the contention that the Greek curves were solely optical corrections had no standing; consequently, the contention that the mediæval curves could be derived from classic because they were not optical corrections had no standing either.

The Curves of Italy.

In his fourth lecture Mr. Goodyear began by comparing dates for the known architectural curves of antiquity. There was, he said, a gap of 700 years between the curves of Medinet Habou and those of Paestum, but we did not on that account hesitate to derive the Greek curves from the Egyptian. There was a gap of 700 years between the curves of the Maison Carrée and those of the Parthenon, but we did not on that account hesitate to derive the Roman curves from the Greek. We knew that the intervening monuments had disappeared, and were certain that many of them would furnish connecting links if all were still in existence. There was a gap of 400 years between the curves of the Maison Carrée and those of the sixth century as found in St. Sophia, at Constantinople, and in S. Apollinare Nuovo at Ravenna. This gap was less than those which intervened between the curves of the ancient monuments.

Mr. Goodyear then described the curves in plan of S. Apollinare Nuovo at Ravenna; of the cloister of the Celestines at Bologna (twelfth century), in which the curves rise from the foundations and are convex to the centre of the court on all sides, with a deflection of 5 ins. in 50 ft. at the second storey; of the cloister of S. Zeno at Verona; the curves in plan and curves in elevation of Pisa Cathedral; and finally the curve in plan of St. Mark's façade and the curves in elevation in the gallery parapets of the interior.

Reference was then made to the certificate attesting the constructive existence of these last curves which had been furnished by Commendatore Pietro Saccardo, who for seventeen years was director of the repairs of St. Mark's and forty years connected with the administration of the repairs.

THE DEVELOPMENT OF ENGLISH HOUSE BUILDING.

AT the last meeting of the Sheffield Society of Architects and Surveyors Mr. W. J. Hale gave a lecture on English architecture of the sixteenth century—from 1550 to 1600. The buildings of this period, he said, showed the struggle between the older Gothic forms and the newer classical ones imported from abroad. At first many buildings presented combinations of the styles, and even at the end of the sixteenth century the Gothic spirit had not been completely vanquished. Speaking broadly, the artistic struggle was between the horizontal and the vertical lines, between symmetry and balance on the one hand and irregularity and picturesqueness on the other. One of the features of the time was the practical cessation of church building, due no doubt to the suppression of the monasteries and the change in the religious thought of the people. Another feature was the increase of house building, especially that of large houses for the nobility and leaders of the land, due to the greater desire for display, and in a measure to the rise of a different class to positions of wealth and influence. The old

simple arrangement of a large common hall, with a portion cut off by screens to serve as a passage to the kitchen quarters, was found inconvenient, and as the plan was developed to meet new needs it affected in its turn the general elevations of the building. Prominent features such as doorways, fireplaces, &c., were first affected by the new ideas, whilst the general composition preserved the old spirit. On the other hand, the mullioned window held its own, and, indeed, grew both in width and height, so as to become one of the striking features of the period. The Gothic string-course was expanded into a small cornice, and jamb mouldings previously worked into the wall stones were succeeded by projecting architraves. Generally speaking, a greater air of finish and comfort, the latter perhaps only superficial, was imparted to the buildings, and served in a measure to distinguish them from those of the earlier Gothic periods.

PROF. BERESFORD PITE ON TRAFALGAR SQUARE.

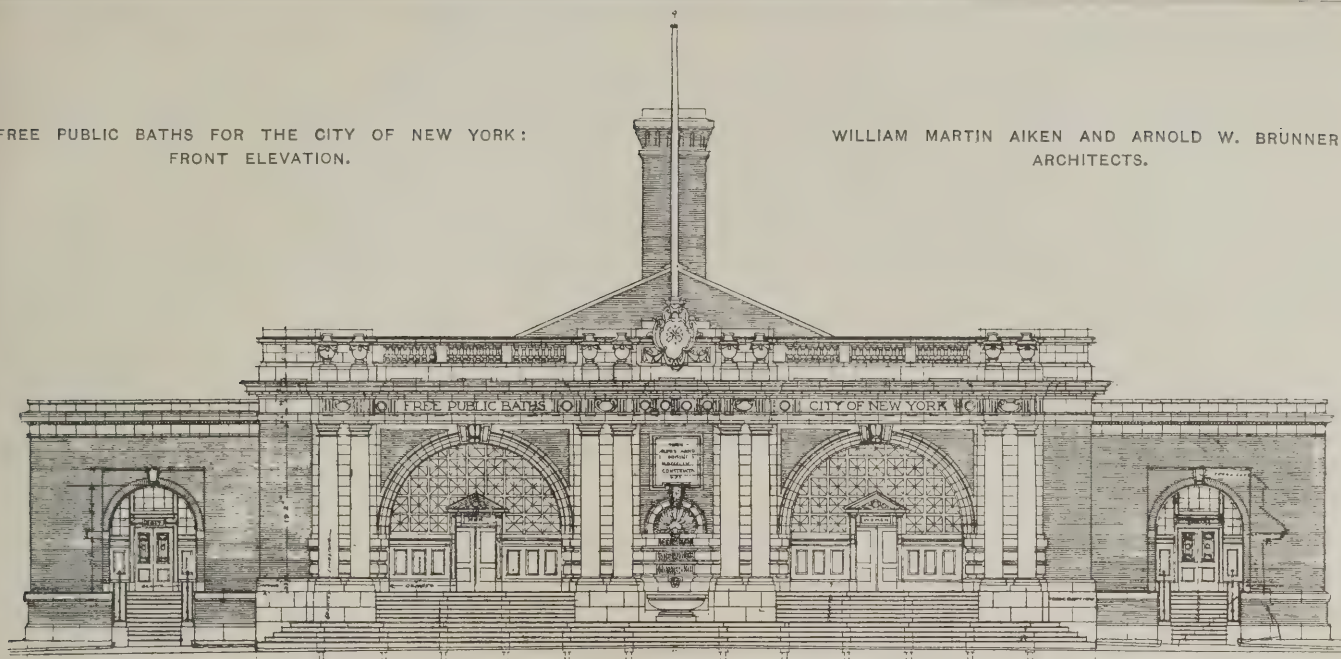
THE Nelson Centenary has served to revive again the projects for the improvement of Trafalgar Square. In reference to this matter Prof. Beresford Pite writes an interesting letter to the "Times," in which he says:—

"Trafalgar Square, as a whole, with its magnificent northern wall, pedestals, fine sweeping steps and descending parapets, completed by granite lamp piers, has a grandeur and consistency of design that we should not be now likely to equal or improve upon if we were to set about a similar task; the fountains and their pools and the pavements accord with the scale of the whole, and the broad paved surface has other values than those of facility of locomotion or of public meeting. The northern buildings of the National Gallery and St. Martin's Church spread and group not unsatisfactorily, while the proportions of the east and west façades are harmonious. I would protest against any distraction of the general breadth of effect by patches of grass or greenery, which would have no harmonious blending with trees or landscape, and also against any meddling by sculptured panels with the stern strength of the granite parapets. Whether or not the water display of the fountains could be varied and improved with practicable regard to the comfort of passers-by on a windy day I cannot say; but the experience gained with Mr. Gilbert's artistic use of water jets and sheets at the Shaftesbury memorial fountain in Piccadilly Circus is not encouraging, as they have nearly all suspended operations since the opening day.

"It is true that the National Gallery façade has been a byword among the picturesque enthusiasts of the Gothic Revival, but their point of view is now a thing of the past, and modern architects could be effectively challenged, by the ghost of Wilkins, its designer, to produce an equally satisfactory elevation with the limited means at his disposal.

The "Exaggerated Candlestick."

"If improvement is desired in commemoration of the Nelson Centenary, it might well be concerned with the detached monuments of the square and with the principal of them, namely, that to Nelson himself. Supposing that it is not possible to leave it alone (I could wish that it were for history's sake alone), nothing better could be done than to take it down and erect a better memorial in its place. The huge monumental Corinthian column is in itself an absurdity of proportion which destroys the success and the scale of the whole square. Its immoderate height and isolated position dwarf all attempts at decoration, and interfere with all central views of or from the buildings of the National Gallery. Our

FREE PUBLIC BATHS FOR THE CITY OF NEW YORK:
FRONT ELEVATION.WILLIAM MARTIN AIKEN AND ARNOLD W. BRÜNNER
ARCHITECTS.

sense of unsatisfactoriness in the front of this building is due to the persistent way in which the column fills the eye and mars architectural effect, reducing its portico and the not ungraceful dome above to meanness. No one pretends that the column is itself beautiful; it is too suggestive of an exaggerated, old-fashioned candlestick to be pleasant, and it dwarfs rather than magnifies the statue upon its summit. Our hero is put completely out of the reach of affectionate glances in passing and repassing, and we have to be content with seeing Sir Edwin Landseer's damp-looking mammoth lions, which again illustrate, on another scale, the difficulties of proportioning anything to such a column. The column and its appendages are really unworthy monuments of art. The sentiments of overwhelming gratitude for national services should be better expressed in a monument on a juster scale, and Trafalgar Square released from an incubus on its architectural effect which I have no doubt that all are indefinitely conscious of.

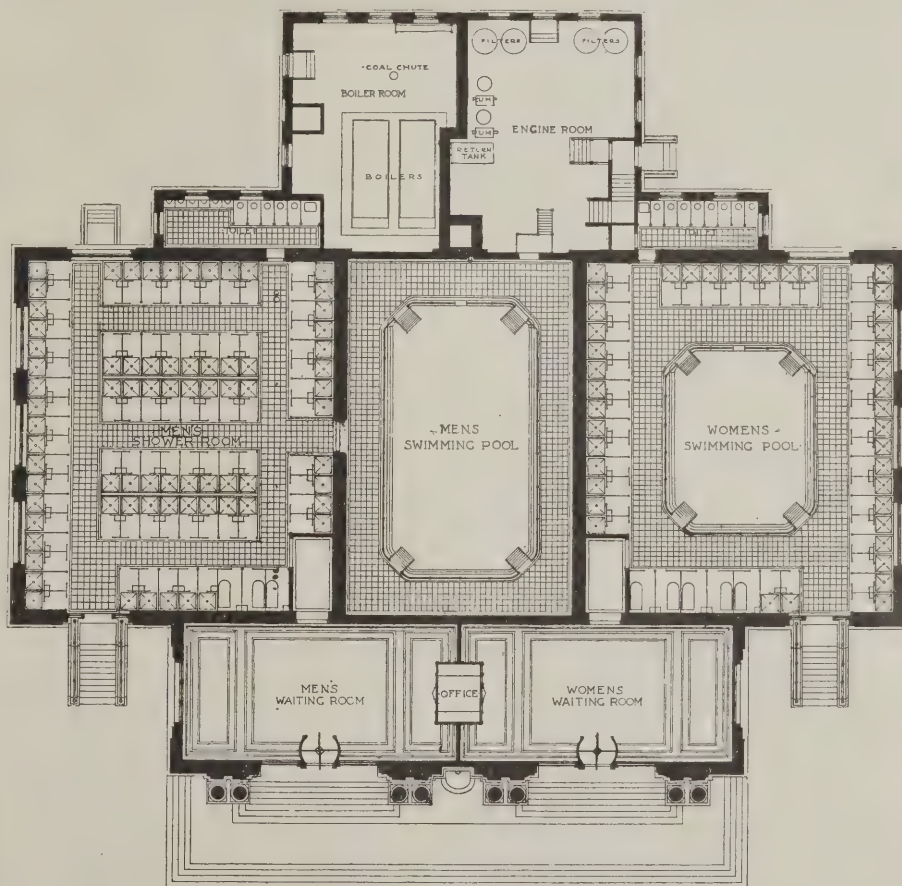
"If a beautiful and satisfactory monument cannot be provided now to Nelson, it will be preferable to leave things just as they are and seek some utilitarian outlet for our enthusiasm. . . ."

AMERICAN BATHS.

WITHIN the past few years the city of New York has been building a number of public bath-houses and has generally adopted the plan of overhead shower-baths. The double compartments, one used as a dressing-room and the other containing the shower (placed at an angle), is now an accepted type.

On this page we illustrate some new public baths to be built in Avenue A, 23rd and 24th Streets, to replace the floating baths in the East and North Rivers, which were discontinued on account of the contamination of the water by sewage. The plan will be studied with interest by English architects. It is a combination of shower baths and swimming baths. The arrangement provides for seventy-five showers for men and forty-two for women, it being an essential part of the scheme that every bather must first use the shower bath before being admitted to the plunge.

The swimming baths vary in depth from 3ft. 6ins. to 6ft. Around the edge is an overflow trough, for taking away any impurities that may form on the surface of the



water, and at one end of the main bath is a gallery for visitors, reached by a separate entrance from the outside. The roofs of all compartments are supported by iron trusses, each having a skylight in the centre. The extreme width of the building is 163ft. and the extreme depth 140ft. There are two large waiting-rooms, one for men and the other for women, each 25ft. by 50ft. The men's plunge is 42ft. by 66ft.; the women's plunge 25ft. by 49ft.

In planning these baths the main thought has been to facilitate the administration and to expedite the handling of the crowds of bathers. To this end the entrances and exits for men and women have been provided separately, so that those leaving the bath-

house do not meet the others waiting for admission.

The interior will be finished with enamelled brick walls, marble partitions between the shower-baths, and terrazzo floors, with a minimum amount of wood. The walls of the swimming baths are to be lined with heavy plates of opaque glass, and the corners rounded. The exterior of the building is to be constructed of Harvard brick, relieved with trimmings of Indiana limestone below and terra-cotta above the cornice line. On account of the nature of the soil it is to be built on piles; and as coal cellars are inadvisable, overhead storage rooms for coal are provided, the fuel being brought to the boiler-room by gravity.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters. Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication. Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Cleansing an Oven.

COUNTENANCE writes: "Which is the best way to make an ordinary kitchen oven clear of smoke when cooking? The oven in question has been neglected and grease and fat have contaminated the shelves and sides. Washing with soda and scraping has very little effect."

I am told that burning charcoal in the oven will cleanse it, but I do not myself think there is any better way than you have already adopted—continual scraping

F. S. I.

Aggregate Width for Exits.

BRISTOL.—YOUNG ARCHITECT writes: "A short time ago an urban council refused to pass plans of mine for a small chapel, on the ground that the aggregate width of external doorways was insufficient, and the council informed me that the width must be increased to 1ft. per twenty persons. I notice, however, by your issue of October 18th that the aggregate width of external doors in the new City Hall at Edinburgh is given as 1ft. per forty-four persons. This leads one to think that the council exceeded their rights in demanding the alteration stated, especially as they have no stipulations as to exits in their by-laws."

Does not the explanation of the apparently varying standards mentioned lie in the fact that the Edinburgh City Hall is very much larger than the chapel you cite? The correct area of exit for 1,000 persons can hardly be reckoned at the same ratio as that for 100 only.

F. S. I.

Dots over Figures in Quantities.

BRISTOL.—W. J. P. T. writes: "Please explain the following question, set at a recent examination: 'Work out the following dimensions, showing in detail the method adopted:—

$$\begin{array}{r|l} 2/14 & 12.6 \\ \text{cube } 2 & '9 \\ & '24 \end{array}$$

I have looked carefully through Leaning, Fletcher and other text-books, and can find no reference to the dot over a figure as used above."

In writing dimensions the "dotting-on" of a figure in the "timesing" is equivalent to a plus sign. Thus in the example given the result is $14 + 2 \times 2 = 32$ times the dimension. Had it been written $2^{1/14}$ the result would have been $2 + 14 \times 2 = 56$ times.

W. E. D.

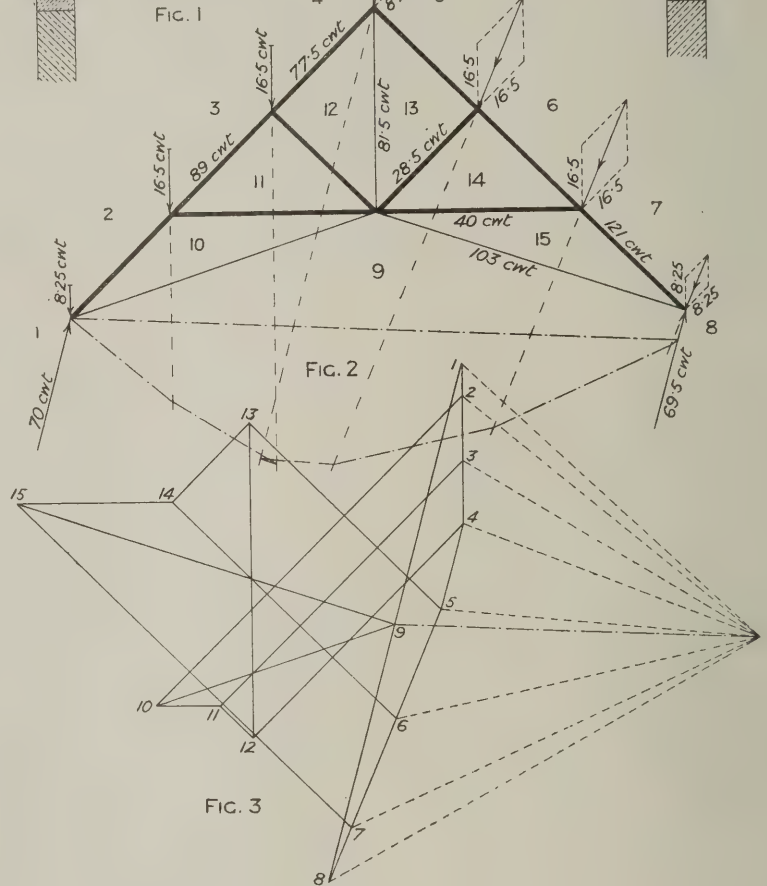
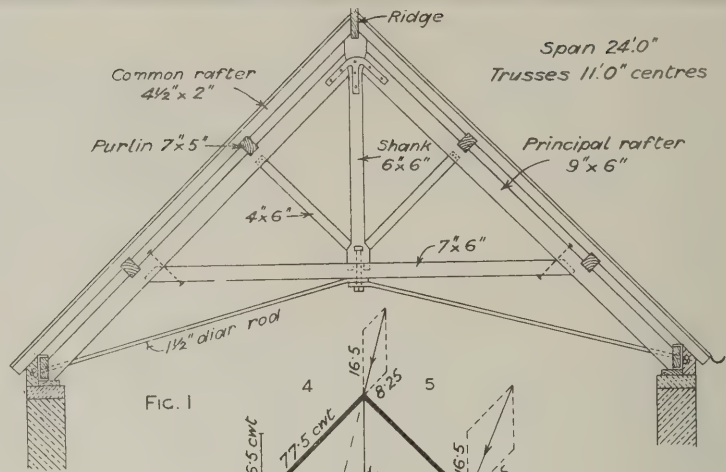
Value of Constants in Formulae.

WATFORD.—FERRUM writes: "What variations are made in the following formulae when steel is used in place of wrought-iron? The text-books do not make this clear. Gordon's formula for struts and pillars,

$$B.W. = \frac{16}{1 + \frac{l^2}{ad^3}}$$

$$B.W. = \frac{cad}{L} \quad (c = 7 \text{ for B.W. in centre})."$$

The constant (f) in Gordon's formula, $P.W. = \frac{fs}{1 + \frac{ad^2}{l^2}}$, corresponding with 16 for



ROOF OF SMALL HALL.

wrought-iron, would be 24 for mild steel and 36 for cast-iron. The constant (c) in the formula for rolled joists, $B.W. = \frac{cad}{L}$, corresponding with 7 for single wrought-iron joists, would be 6 for compound girders of wrought-iron, 10 for rolled steel joists, and 9 for compound girders of rolled steel, all having their top and bottom flanges equal.

HENRY ADAMS.

Roof of Small Hall.

GLASGOW. — ARCHITECT'S ASSISTANT writes: "Do you consider that the accompanying section of a small hall is good construction and safe to be erected; if not, what is required to make it so? The walls are of brick, hollow, gins. on the outside and 4 1/2 ins. on the inside, with a 4 1/2 in. space between, except directly under the main trusses, where the walls are 18 ins. square, solid. The main trusses are 11 ft. apart and the hall is 24 ft. wide."

Your truss is badly designed, as the purlins do not come over the struts, and therefore cause unnecessary cross strain on the principal rafters. Fig. 1 shows a more satisfactory truss, which only decreases the headroom in the centre by about 18 ins. Fig. 2 is the frame diagram for Fig. 1, the maximum

stresses being marked on the various members, and Fig. 3 is the stress diagram. The scantlings have been calculated from these stresses, and are marked on Fig. 1. With regard to the hollow walls, it is usual to have 4 1/2 in. cavity spaces, the more common arrangement being a 2 in. continuous cavity with a 4 1/2 in. wall on the outside and a 9 in. wall inside. Where the trusses come, a half-brick pier is often built on the inside.

HENRY ADAMS.

Provisional Amounts and a Deed of Assignment.

SHREWSBURY.—G. D. L. writes: "The contractor of a building nearly completed has made a deed of assignment of his estate. I have received notice from his trustees claiming any balance that may be found owing in respect of the contract. In the bills of quantities there are several provisional amounts to be expended at my discretion and under my supervision. For some of these items I personally gave the orders, and practically assured the various tradespeople supplying the goods that I would keep sufficient money in hand on the contract to ensure their payment. The form of contract used was the printed one issued by the R.I.B.A., where the quantities do not form part of the contract. The trustees under the

deed of assignment maintain that these firms must be considered as creditors of the estate, and they claim the amount due to them as part of the assets of the estate. I on the other hand claim that under the contract I have full power to deal with these provisional amounts, in spite of the builder's deed of assignment. Would I be right, therefore, in issuing certificates for the p.c. amounts to be paid direct by my clients to the various tradespeople, deducting the amount from the contract and handing the balance to the trustees? If not, have the tradespeople any claim upon me for giving them the order, although they delivered the goods direct to the contractor?"

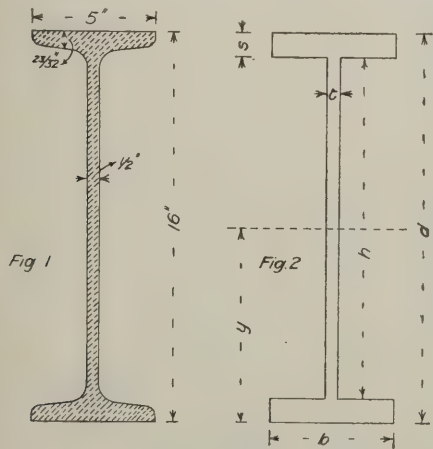
I am of opinion that the trustee under the assignment is right. (1) The tradespeople are not parties to your building contract, and they are in no better position than are other creditors of the bankrupt. (2) Therefore I do not think you can pay these sums in full and deduct from the balance of contract sum which is still owing. (3) The tradespeople have no claim against you personally, if you made it clear to them that you were selecting goods as architect only and not purchasing upon your own account. (See case in King's Bench Division, December 11th, 1902—*Gardner v. Wimperis and Arber*. F. S. I.

Strength of Rolled Joist.

PETERBOROUGH.—H. J. W. writes: "Please calculate the load that may safely be uniformly distributed upon a rolled steel joist 16 ins. by 5 ins., having flanges averaging 1 in. thick, with a span of 20 ft."

The effect of the load upon a beam is measured by the bending moment, and the strength of the beam is measured by the moment of resistance. These are always equal, or Effort = Resistance. Let M = bending moment in ton-inches; R = moment of resistance in ton-inches; w = distributed load in tons; l = span in inches; I = moment of inertia in inch-units in plane of bending; y = distance in inches from neutral axis to furthest edge of section; c = modulus of rupture in tons per square inch, commonly called extreme fibre stress, say 8 for mild steel; z = modulus of section, or value due to shape and size of section = $\frac{I}{y}$. Then $M = R$,

and $\frac{wL}{8} = zc$, where $w = \frac{8zc}{l}$. The moment of inertia may be found graphically, or may be calculated from the dimensions. The true section is as Fig. 1, but it may be



assumed as Fig. 2; then the area is given by the formula $A = bd - h(b - t) = (5 \times 16) - 14(5 - \frac{1}{2}) = 80 - 63 = 17$ sq. ins., the moment of inertia $I = \frac{bd^3 - h^3(b - t)}{12} = \frac{5 \times 16^3 - 14^3(5 - \frac{1}{2})}{12} = \frac{20480 - 12348}{12} = 677.6$, and the modulus of section

$$z = \frac{I}{y} = \frac{bd^3 - h^3(b - t)}{6d} = \frac{5 \times 16^3 - 14^3(5 - \frac{1}{2})}{6 \times 16} = \frac{8132}{96} = 84.7. \text{ Then } w = \frac{8zc}{l} = \frac{8 \times 84.7 \times 8}{20 \times 12} = 22.6 \text{ tons.}$$

It should be noted that the ordinary section of this size rolled steel joist is 15 x 5 x 50 lbs. with an average thickness of flange of $\frac{3}{8}$ in. and a web $\frac{1}{4}$ in. thick, carrying 18 tons over a span of 20 ft., with $A = 14.7$, $I = 556.5$ and $z = 69.6$.

HENRY ADAMS.

Fireproofing Wood.

MORPETH.—L. A. L. writes: "Please name some paint or solution for woodwork which will render it fireproof as far as possible, or even allow the wood to smoulder only."

Coating wood with a paint or solution to retard the burning is of very little use. The wood should be impregnated, and we advise you to purchase wood rendered fire-resisting, or else to protect the woodwork with a ceiling of pumice or porous tile slabs, slag-wool pugging or cement plastering on expanded metal.

PAINTS AND PAINT-WORK.—VI.

(Continued from p. 154, No. 553.)

VEHICLES.—III. Turpentine Substitutes and Adulterants.

FROM time to time many substitutes for turpentine have been placed upon the market under all sorts of fancy names. Some of these are good and may be used with advantage, being fully equal, if not superior, to the ordinary commercial turpentine. The majority of them, however, are inferior, and care should be taken to thoroughly test any substitute which is used. The substances used in the making of substitutes are cheaper vehicles, and they are also found used as adulterants of turpentine. These substitutes are usually resin spirit, benzene, and shale and coal-tar naphthas.

The first mentioned—namely, resin spirit—is a very good substitute or adulterant; in fact, there can be little objection to its use. It is obtained in the distillation of turpentine from the crude resin, and consists of a volatile liquid, water-white or tending towards a brown colour according to the degree of purification. Its specific gravity is about .88; it is thus heavier than turpentine. It has a low flashpoint, just above the ordinary summer atmospheric temperature, and it dries in the air by partly volatilizing and partly oxidizing, just in the same way that turpentine does, except that the resinous remainder after oxidization is not so much as with turpentine; consequently it is weaker. The addition of resin in solution raises this, however. In our last article we referred to the importance of this residue, because upon it depends to a great extent the value of turpentine, this acting as a binder for the pigment. The smell of resin spirit is not nearly so pleasant as turpentine, and in this way it can be detected, though this is often somewhat difficult. The danger with resin spirit is that it may contain traces of resin oil, due to want of care in the refining, and this prevents proper drying. Resin spirit enters into a large number of substitutes for turpentine, and is largely used for making cheap varnishes with resin. When used for turpentine substitutes the resin spirit is very often mixed with shale naphtha or benzene, which we will now refer to.

Benzene is obtained from the distillation of petroleum, and is also known as benzoline and petroleum spirit. The character of the liquid is well known. Its specific gravity ranges from .73 to .76. It has a low flashpoint, flashing at the ordinary atmospheric temperature. This is one of the largest sub-

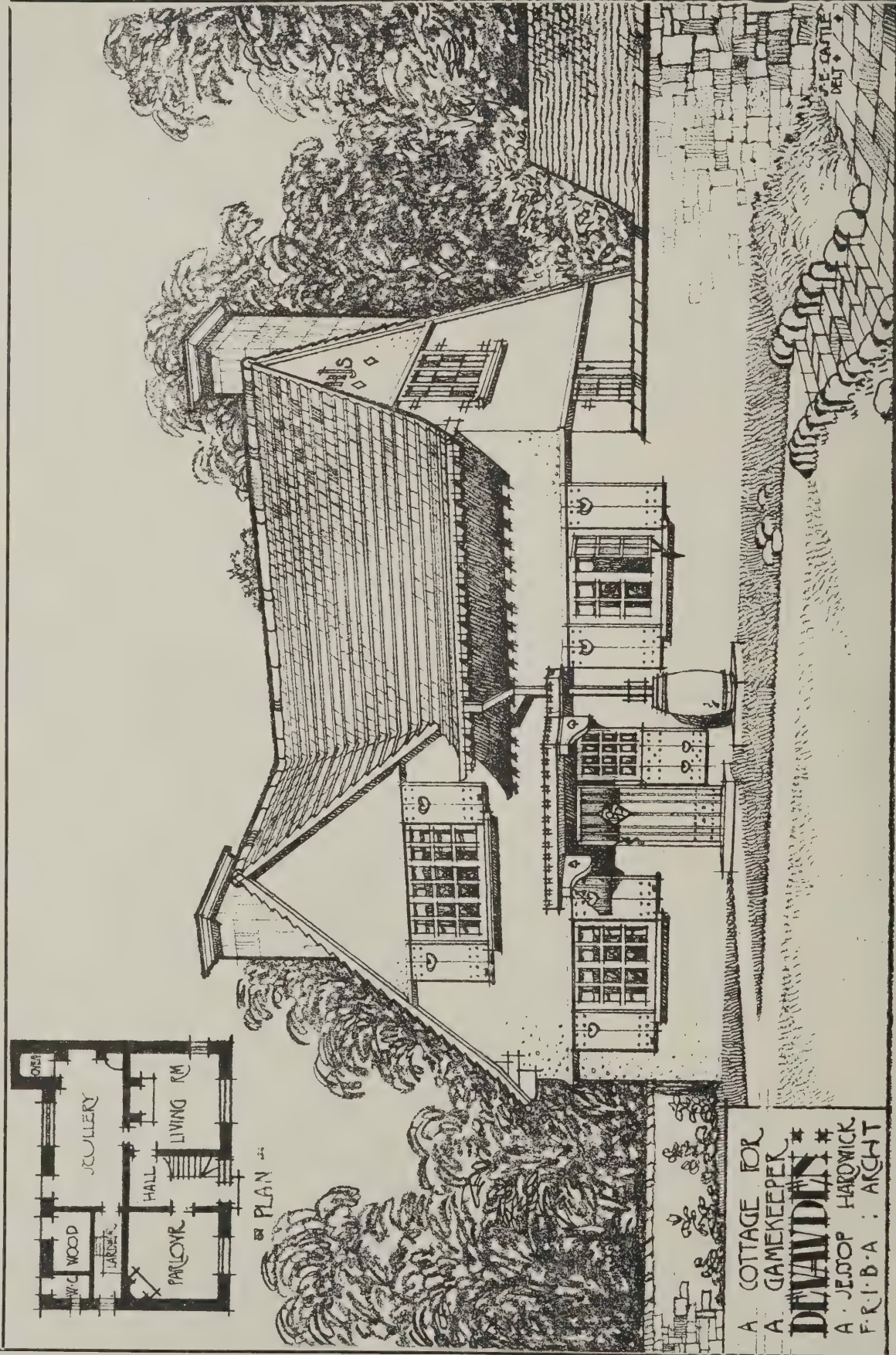
stitutes for turpentine, and is serviceable when it is pure, but unless the distillation has been very carefully attended to it is liable to the danger of contamination by paraffins. Large quantities of benzene are used for driers. Some varieties on the market used for turpentine substitutes are rather heavier than pure benzene, and as they are not quite so inflammable they have been thought to be better than pure benzene; but as this heaviness is produced by the amount of petroleum and paraffin products in solution they are inferior to benzene. Very few of the petroleum products are free from paraffin wax or the non-volatile members of the paraffin series, or other non-volatile substances, and it is because of these that paints made with benzene have a tendency to peel. The reason is that when the paints dry the volatile portion of the benzene (or other petroleum product) passes away, the non-volatile portion remaining to be soaked up by the wood. This soaking up of an oily and slippery substance like paraffin wax into the wood prevents the paint layer from adhering to the surface of the wood. Whereas the non-volatile part of turpentine is very adhesive and helps to bind the paint to the surface, the non-volatile part of petroleum products fills the pores of wood, and this prevents paint from adhering or causes it to peel and scale off more rapidly than it naturally has a tendency to do.

Shale naphtha is obtained from the distillation of the shale found in Scotland between Glasgow and Edinburgh. It has a specific gravity of .73 to .76, and it flashes at ordinary temperatures. It consists chemically of a mixture of hydro-carbons belonging to the paraffin and olefine series, and the remarks made above with reference to benzene apply equally to this substitute. Coal-tar naphtha is obtained in the distillation of coal-tar. It has a specific gravity varying between .86 and .87, and is of a water-white colour. This also has a very low flashpoint, below the ordinary atmospheric temperature. It is used considerably for making quick-drying varnishes with resin. This is also liable to deleterious impurities. It has a distinctive smell which shale naphtha and benzene have not, smelling strongly of coal-tar.

It will be noticed that the benzene and naphtha substitutes and adulterants of turpentine all have low flashpoints, and thus they are dangerous in use, a point which cannot be overlooked in practice as paint-work has of course to be done in the interior of buildings. The objection most strongly applies, however, to painters' shops.

The conclusions we may come to from the above is that substitutes for turpentine may be very useful and unobjectionable if the substances composing them are very pure and do not contain non-volatile matters, which would fill the pores of the wood and so cause the paints to scale. Their effect upon the scaling of paints is not very apparent at once in use, requiring some time to develop. The architect needs to take particular care to see that the substitutes and adulterants of turpentine are trustworthy, either by specifying carefully in regard to the matter and testing what the painter is using or the paint materials that come from the manufacturer, or else to see that the work is given into the hands of a firm that knows its business and may be depended upon to give good work. One point in regard to benzene and naphtha substitutes for turpentine is notable, namely, that they do not leave a residue of resinous matter such as turpentine or resin spirit do, and that paints made with them do not dry with such a gloss as with turpentine. Means are taken in some of the substitutes to repair this deficiency by adding resin.

(To be continued.)



A COTTAGE FOR
A GAMEKEEPER
DEVAUDEN
A. JESSOP HARDWICK
F.R.I.B.A. ARCHT

The above cottage at Devauden, near Chepstow, has recently been erected of local stone, rough-cast, with tiled roof. Most of the external woodwork is oak, left natural. The gutters and down pipes are painted black. The architect was Mr. A. Jessop Hardwick, F.R.I.B.A., of Kingston-on-Thames, and the builders were Messrs. E. Turner & Sons, of Cardiff.

NEW LONDON BUILDINGS.

AT yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics* :—

Buildings on a site on the north side of Manor Road, Stoke Newington, between Nos. 4 and the Great Eastern Railway, on the application of Turner & Holditch, on behalf of F. Matthews. (*Consent.*)

One-storey shops at Nos. 164 to 172 (even numbers only) inclusive, Earl's Court Road, Kensington, to abut also upon Penywern Road, on the application of W. G. Hunt, on behalf of Jones Brothers. (*Consent.*)

One-storey shops in front of Nos. 435 and 437, Edgware Road, Paddington, on the application of Gardiner and Theobald, on behalf of Meux's Brewery Co., Ltd. (*Consent.*)

One-storey shops in front of Nos. 431 and 433, Edgware Road, Paddington, on the application of Gardiner & Theobald, on behalf of Matthews & Son, Ltd. (*Consent.*)

One-storey shops in front of Nos. 439 to 451 (odd numbers only), Edgware Road, Paddington, to abut also upon Maida Hill West, on the application of Boehmer & Gibbs, on behalf of W. Hirsch. (*Consent.*)

Residential flats, with bay windows, upon the site of Nos. 79 to 105 (odd numbers only) inclusive, Park Road, Regent's Park, on the application of Sir Arthur Blomfield & Sons, on behalf of H. Johnson. (*Consent.*)

One-storey shops on part of the forecourts of Nos. 103, 105 and 107, Brownhill Road, Lewisham, on the application of Norfolk & Prior, on behalf of Mrs. Staines. (*Consent.*)

Oriel windows and porches in front of four houses on the east side and four houses on the west side of Turney Road, Dulwich, on the application of G. A. Lansdown, on behalf of H. J. Williams. (*Consent.*)

A classroom addition on the east side of Oaklands Congregational Church, Uxbridge Road, Hammersmith, on the application of S. Powell, on behalf of the committee of the church. (*Consent.*)

An iron and glass porch in front of No. 73, Burnt-ash Hill, Lee, on the application of Stocker & Roberts, on behalf of F. W. Zuthorst. (*Consent.*)

Iron and glass porches in front of houses on the north-east and south-west sides of Chudleigh Road, Brockley, on the application of J. W. Heath & Sons. (*Consent.*)

Retention of a projecting shop front at No. 28, Arlington Road, St. Pancras, on the application of J. H. Hignell, on behalf of P. Natus. (*Consent.*)

A projecting flue on the eastern side of the Savoy Hotel extension to project in Savoy Buildings, on the further application of Colcutt & Hamp, on behalf of the Savoy Hotel, Ltd. (*Consent.*)

Oriel window and turret at the corner of Mill Hill, Place and Wimpole Street, St. Marylebone, on the application of W. Wallace, on behalf of Debenhams, Ltd. (*Consent.*)

Buildings on the west side of Brixton Hill, between Acre Lane and Hayter Road, Norwood, on the further application of Gush, Phillips, Walters & Williams, on behalf of R. A. Johnston and Miss C. S. T. Johnston. (*Refusal.*)

Buildings on the eastern side of Fulham Palace Road, abutting also upon the southern side of Childerley Street, Fulham, on the application of F. C. Cole, on behalf of the trustees of the Fulham Waste Land and Lygon Almshouses Charities. (*Refusal.*)

An iron sign upon the forecourt of No. 205, Clapham Road, Brixton, on the application of the Granville Motor Engineering Co. (*Refusal.*)

A building at the rear of No. 449, Fulham Road, Chelsea, to abut upon Gunter Grove, on the application of W. F. Hurdall. (*Refusal.*)

Porches to Nos. 7, 8, 9, 10, 11 and 12, Ruskin Walk, Herne Hill, on the application of A. M. Deacon, on behalf of R. E. Mayo. (*Refusal.*)

A building on the southern side of Eastcomb Avenue, Greenwich, to abut also upon the eastern side of Wynd-cliff Road, on the application of Beadel, Wood & Co., on behalf of the Norwich Union Life Insurance Society, and F. R. Barrett. (*Refusal.*)

Buildings on the west side of Belle Vue Crescent, Finchley Road, Hampstead, on the application of Brown & Barrow, on behalf of the trustees of the Burgess estate. (*Refusal.*)

An iron and glass-covered way at No. 38, Finchley Road, St. Marylebone, on the application of Ritchie & Co., on behalf of Mrs. Lupton. (*Refusal.*)

An iron and glass canopy and electric lamp in front of No. 37, Victoria Street, Westminster, on the application of Griffin & Woollard, on behalf of J. B. Martin, G. Hastings and H. Webley. (*Refusal.*)

A temporary wood and iron-covered way at the entrance to 97, Stamford Hill, Hackney, on the application of F. Tite, on behalf of Mrs. L. Tite. (*Refusal.*)

An iron and glass covered way at the entrance to the Islington Infirmary, Highgate Hill, Islington, on the application of W. Smith, on behalf of the Guardians of the Poor of the parish of St. Mary, Islington. (*Consent.*)

Buildings on part of the open space at the rear of Nos. 164 to 172 (even numbers only) inclusive, Earl's Court Road, Kensington, on the application of W. G. Hunt. (*Consent.*)

Building on Lot 11, Goldsmith's Row, Haggerston, on the application of F. B. Healy. (*Consent.*)

Three buildings on the western side of Tooting High Street, at the corner of Selkirk Road, Wandsworth, with irregular open spaces at the rear on the application of J. C. Radford, on behalf of C. S. Merrett. (*Consent.*)

An addition to No. 9, Southwick Place, Hyde Park, on the application of R. S. Ellis. (*Consent.*)

A house on the north-western side of Atherfold Street, Clapham, on the application of V. Vagnolini, on behalf of W. P. Goosey. (*Refusal.*)

Means of escape in case of fire on the top storey of "Craven House," Kingsway, on the application of H. Tanner, jun., on behalf of J. Mitchell & Co. (*Consent.*)

Means of escape in case of fire on the sixth (top) storey of Nos. 110 and 111, Fleet Street, City, on the application of Smees & Houchin, on behalf of Cook & Sons. (*Consent.*)

An addition to No. 247, Rotherhithe Street, Rotherhithe, such building and addition to exceed in extent 250,000, but not 450,000 cub. ft., and to be used only for silver and lead refining, on the application of M. T. Shaw & Co., Ltd., on behalf of H. J. Enthoven & Sons, Ltd. (*Consent.*)

Iron, brick and concrete additions to the generating station, Townmead Road, Fulham, on the application of A. J. Fuller, on behalf of the Metropolitan Borough of Fulham. (*Consent.*)

A sub-station on the site at the rear of Nos. 5 and 6, Blomfield Road, abutting upon Portsdown Road, Paddington, on the application of S. Highfield. (*Consent.*)

Residential flats on the site of Gloucester House, to abut upon Piccadilly and Park Lane, St. George, Hanover Square, on the application of Colcutt & Hamp, on behalf of J. J. Duveen. (*Consent.*)

The Theatres and Music Halls Committee also reported the following :—

Plans submitted by Rowland Plumbe, on behalf of the chairman and committee of the Central Young Men's Christian Association, showing how it is proposed to give effect to certain of the suggestions made by the Council for the structural improvement of Exeter Hall. (*Consent.*)

Plans submitted by R. H. Kerr showing certain alterations which have been made at the Gambrian Restaurant, Rupert Street. (*Consent.*)

Plans submitted by Owen & Ward showing an alteration proposed to be made in the arrangement of the balcony and circle tier at the Prince's Theatre, Poplar, now in course of erection. (*Refusal.*)

Plans submitted by Kings & Myers showing arrangements proposed to be adopted in the construction of a music-hall in Upper Tooting Road. The plans show that the hall will be one with two tiers above the ground floor. Accommodation is shown for 11,420 persons seated and 556 standing. The Committee are considering the whole question of standing in places of public entertainment, and think that the applicant should be informed that the approval of the present plans is subject to any decision that may be arrived at hereafter. (*Consent.*)

Conversion of the Putney Baths into a music-hall, on the application of W. Hancock. (*Consent.*)

Plans submitted by A. Davis, showing the arrangements at the Spitalfields Arcade, Fashion Street, in respect of which premises notice of intended application for a music licence has been received. The premises, which are in course of erection, will be used as a market, and consist of shops or booths on each side of two avenues which run the length of the building and are called North and South Avenues. On the first floor level there are also booths opening on to galleries connected by bridges. (*Consent.*)

A.A. CONVERSAZIONE.

THE annual conversazione of the Architectural Association was held on Friday evening at 18, Tufton Street, Westminster, where the president (Mr. E. Guy Dawber, F.R.I.B.A.) and his wife received a very large gathering. On the walls and in the classrooms were displayed photographs of the annual excursion to Lisieux and the week-end visit to Cambridge, and photographs by members of the Camera and Cycling Club, as well as a selection of students' work and architectural sketches. Altogether the evening was a great success.

"The Tufton Street Tatler."

The second "spasm" of this welcome periodical was issued at the conversazione, and its perusal provided the keenest enjoyment. The editors are to be congratulated on the many clever things contained in the publication. Two pages are devoted to "Mr. Ballee Rhott, M.S.A.—perhaps the greatest master of the Redundant Buttress and the originator of Puzzle Furniture": after which come some architectural verses in parody of Tennyson, Kipling, Swinburne and Gilbert—the last being as follows :—

If you want a receipt for that popular mystery Known to the world as "Art Nouveau" to-day, Take all the remarkable styles known to history, Rattle them off to this popular lay.

Pyramids pillaged by mad Egyptologists, Byzantine knowledge of stresses and strains, Those who are blatantly keen archaeologists, Study the question of Optical drains, The culture of Greece that was cribbed by the Romans, The luxury-loving Pompeian remains, The three styles of Gothic are sure of survival (Though save us, ye Gods, from another Revival Where Barrys and Burgesses clash as they meet The fancy of Pugin in every Street). The wit of the artists who reigned with Queen Anne, The skill of John Thorpe in devising a plan, Think of a Phidias or a Calliocrates, Christopher Wren or a William Wyke: that is Dead, to be followed by Matcham & Co., The Classic Revival, and Mr. Caroe!

Take of these elements all that is fusible, Melt them all down in a pipkin or crucible; Set them to simmer, and isn't it rum! Our boasted New Art is the layer of scum.

"Mr. Dooley on Arch-tects" is another amusing contribution, and the quips and oddities throughout the remainder of the issue are well worth reading. The fun is never bitter. We notice an addendum of additional courses about to be instituted, beginning with some lectures and demonstrations on the use of the English language as a means of expression—for Institute examiners (text-books: Kipling's "Barrack-room Ballads" and the Mazawattee Penny Primer) and including some intended for our own especial benefit: the list however is conspicuously incomplete and we respectfully suggest the following addition :—

Lectures on Purple Puerilities.

For Budding Journalists.

Lecturer: Mr. Ballee Rhott.

Text-Books: Back numbers of "Truth" and Ireland on "Mental Afflictions."

"The Tufton Street Tatler" is obtainable from Messrs. Farmer & Sons, Kensington High Street, price 6d. (post free, 7d.).

Competitions.

Library, Cheshunt.—The competition for a public library at Cheshunt has been decided as follows :—1st, Mr. J. Myrtle Smith, Chelsea; 2nd, Mr. Ernest A. Sudbury, of Nottingham; 3rd, Mr. Richard Wylie, of Gateshead.

Library, Greenwich.—In the competition for a branch library at Greenwich the time for submitting designs (originally fixed for November 4th) has been extended to four weeks after the answers to competitors' questions are posted, which will be shortly.

A Library Competition.—Encouraged by a promised gift of £40,000 from Mr. Carnegie, the St. Pancras Council has prepared a scheme for the erection of a central library in the Prince of Wales Road and of four branch libraries. £20,000 is to be spent on the central building, for which a competition is to be held with Sir Aston Webb as assessor.

School, Carlisle.—The competition for a new school to be built at a cost of £12,000 in Norman Street, Carlisle, has been decided as follows :—1st premium (£75), Messrs. Oliver & Dodgshun; 2nd (£30), Mr. F. Lishman; 3rd (£20), Mr. J. W. Benwell—all of Carlisle. Five designs were submitted, the assessor being Mr. Walter H. Brierley.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

THE annual meeting of this Society was held on Thursday last, the president (Mr. G. Bertram Bulmer, F.R.I.B.A.) occupying the chair. The annual report, which was presented and adopted, showed that during the year ending April 30th last the membership had increased from 155 to 174, while the accounts showed a small balance in hand. It was noted in the report that the School of Architecture, under the auspices of the Society, in conjunction with the Leeds Institute and the Leeds University, was proving of great value in preparing students for the R.I.B.A. examinations. Considering the

Conditions of Architectural Competitions, a circular had been drafted pledging the signatory not to submit plans in any competition promoted within the area of the Society unless the conditions accorded with the spirit of the suggestions for the conduct of architectural competitions issued by the Royal Institute of British Architects. This circular had been signed by more than thirty members of the Society.

THE TIMBER TRADE.

London Market in October.

THE London wood market may be said to have improved all round during October. It is an indirect improvement, inasmuch as it does not consist of any actual rise of prices on the spot, nor is it contingent on the more important item of an increase in the local consumption, but it is none the less a real improvement in tone, based on the increasing consumption in other home markets, on a better general trade throughout the country, and on the practical certainty that no further supplies are likely to be laid down here either this year or next at prices which will compete with stocks already here. The October importation was, Messrs. Churchill & Sim state, a small one, and the London consumption also remains small, showing a reduction of 1,200 standards from the docks and of 700 standards overside from the figures for October, 1904. The reduction in the dock stock may now be reckoned at 20,000 standards from that of last year.

Messrs. Denny, Mott and Dickson, Ltd., observe that business during October was marked by an advance in price in most descriptions of wood goods—even the so-long-depressed market for soft woods having felt the influence of the general confidence in better business. The volume of demand during the month was not all that could be wished, but the increased cost of replacing most stocks has become a hard fact, and the indisputable rise in iron and steel is one of the several indications that the demand for structural work has revived in all directions; and it is a mere matter of time as to wood following the movement in price of other material.

Dock Stock.

The stock of wood in the public docks on October 31st was:—

	Pieces.
Foreign deals and ends - - -	1,845,000
Do. battens - - -	2,854,000
Pine deals and battens - - -	982,000
Spruce do. do. - - -	897,000
Boards, rough - - -	4,294,000
Do. prepared - - -	6,841,000

Totalling 17,715,000 pieces, as compared with 20,195,000 in 1904, 22,280,000 in 1903, and 25,025,000 in 1902.

In other kinds the stock was as follows:—

Foreign wainscot logs - - -	89 pieces.
Do. oak timber - - -	665 loads.
Do. fir timber - - -	1,518 do.
Do. Oregon pine, &c., spars and masts - - -	3,897 do.
Colonial oak timber - - -	1,643 do.
Do. birch timber and planks - - -	5,474 do.
Do. elm and ash timber - - -	1,210 do.
Do. yellow pine - - -	577 do.
Do. red pine - - -	94 do.
United States pitch-pine timber - - -	13,488 do.
Do. do. deals - - -	43,000 pieces.
East India teak - - -	7,556 loads.

The deliveries for the first ten months have been of:—

	Pieces.
Foreign deals and ends - - -	2,605,000
Do. battens - - -	4,808,000
Pine deals and battens - - -	886,000
Spruce do. do. - - -	1,171,000
Boards, rough - - -	4,456,000
Do. prepared - - -	12,546,000

Totalling 26,472,000 pieces, as compared with 28,591,000 in 1904, 30,654,000 for 1903, and 32,557,000 for 1902.

The deliveries for October were:—

	Pieces.
Foreign deals and ends - - -	258,000
Do. battens - - -	458,000

Pine deals and battens - - -	104,000
Spruce do. do. - - -	115,000
Boards, rough - - -	481,000
Do. prepared - - -	1,244,000

Totalling 2,660,000 pieces, as compared with 2,829,000 in 1904, 3,019,000 in 1903, and 3,478,000 in 1902.

Deliveries from Ship to Craft.

The deliveries direct from ship to craft for the first ten months of the year have been:—

	P.s.h.	1904.	1903.	1902.
Deals and battens	103,517	97,226	102,061	97,451
Boards - - -	22,204	17,085	20,717	20,955

Total - 125,721 114,311 122,778 118,406

and for October:—

	P.s.h.	P.s.h.	P.s.h.	P.s.h.
Deals and battens	11,125	12,263	13,211	9,544
Boards - - -	2,479	2,029	1,630	2,207

Total - 13,604 14,292 14,841 11,851

Soft Woods.

Swedish Deals and Battens.—The arrivals from the Swedish ports during October were on a very restricted scale, deals, battens and flooring being all far short of what was sent here in October last year. For deals and battens there is no change of price to report since September, but flooring rates have moved up smartly here and there under the influence of a fractional improvement in the demand.

Norwegian Boards.—The quantity of prepared boards imported during October was just under that for October last year, and the demand has been better than for some time past. Prices tend to improve, but without much life in the movement so far.

Russian Deals.—The importation from Russia during October was a very small one, deal sizes in particular showing a great reduction on the figures for October last year. There has been very little improvement in prices on the spot so far, but the c.i.f. prices paid for arrival for the last of the shipments something more than cover the increased rates for freight and insurance.

Finnish Battens.—The supply of Finnish battens during October was slightly under that for October last year. There was no improvement in prices in London.

Prussian Timber.—There was no pressure of fresh supplies of fir timber during October, but the demand has been wretched, and the market has no strength of any sort. For oak timber a little more demand has been experienced, sufficient to carry off a fair proportion of the small stock at rates which leave some profit to importers on the low summer cost.

Canadian Timber.—The importation of pine deals into London continues very restricted. The consumption in October improved. Prices have responded to this latter influence, and are a point or two higher than in September. For spruce deals a great change has come over the market, the improvement which made itself felt in September having developed with much rapidity during the past month. The London market is quite left behind, and shows its usual indifference to rates which it cannot afford to pay; prices are nevertheless up, but not to the same extent as elsewhere. In hardwoods, birch is the most improving property at the moment; oak, elm, and ash being very much neglected. Yellow-pine timber is, perhaps, also better so far as there

is a market for it here at all. The fresh arrivals of sawn timber were on a better scale during October. The deliveries were very poor, showing a reduction of 1,600 loads of floated timber on those for October, 1904. Consequently London prices have been influenced only by the conditions in the shipping marks, where they are advancing week by week and form a barrier far ahead against any possibility of replacing wood sold here at the present quotations. Pitch-pine deals, too, are affected by much the same causes and have improved in price. The month's importation was, however, a full one.

Hardwoods.

Teak.—Messrs. Denny, Mott & Dickson, Ltd., state that the landings in the London docks during October consisted of 585 loads of logs and 252 loads of planks and scantlings, or a total of 837 loads as against 202 loads for the corresponding month of last year. The deliveries into consumption were 270 loads of logs and 342 loads of planks and scantlings—together 612 loads, as against 960 loads for October, 1904. The continued small import of teak is the more disquieting seeing that nearly half of such import consists of Java wood, which, owing to its want of good length and its being heavier than Burmah wood, is not liked for some descriptions of first-class work. It should, however, be recognized by those responsible for the small production (and consequently almost prohibitive present prices) of teak in India—whether Government Forest Administrators or commercial concessionaries of forests—that the production of a part of the British Empire is being discouraged at the cost of the European consumer learning to put his money into the pocket of a Dutch possession; and as Siam teak has continued to displace the consumption of Burmah teak, notwithstanding the original prejudice against it, so will the consumption of Java teak develop and the consumer accommodate himself to the shorter lengths and greater weight, if the undoubtedly superior description from Burmah is not procurable except at an unreasonable high comparative cost. These facts are sufficiently significant to merit the serious consideration of all concerned, both in India and Siam, whilst the merchant on this side can only utilize such facts as may be most advantageous to his business, which admits of little sentiment.

Messrs. C. Leary & Co. report that a healthy general demand, together with the Government requirements for the service of the various dockyards for the coming year (although the latter are on a smaller scale than for several years past), are factors making for a further rise in values. Offers which constitute a distinct advance on recent quotations have been refused by sellers, a course for which the future will almost certainly show there were good grounds.

Mahogany.—The consumption during October was fairly satisfactory, especially for the better class of sizeable wood. Honduras and African descriptions have arrived to hand in sufficient quantity, but the supply of Tobacco is short, and the commencing new season's imports will be welcome. Values, on the whole, while steady, have not appreciably altered.

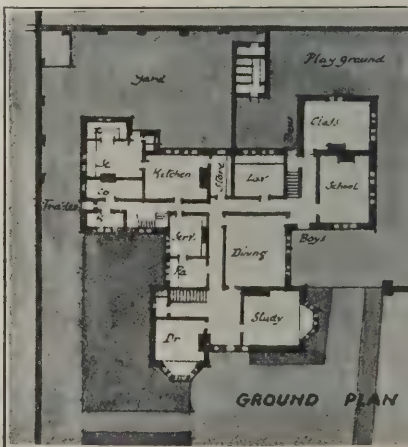
ABSTRACT OF STOCK, CONSUMPTION, &c., FOR OCTOBER.

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock - - -	1,569,446	3,086,851	979,929	898,238	43,093	6,577,557	4,293,579	6,842,759	20,500
Monthly public dock consumption - - -	203,529	471,878	100,155	109,294	8,455	893,311	462,370	1,194,362	2,767
Overside stock - - -	822,257	1,906,387	404,626	441,548	-	3,574,818	1,867,955	1,051,039	-
Overside consumption (estimated of dock):—									
82 per cent. Sawn } 55 " Planed }	166,894	386,940	82,127	89,621	—	725,582	379,143	656,899	—
Duration of supply at same rate of consumption - - -	6'46 months.	5'81 months.	7'60 months.	6'74 months.	5'10 months.	6'27 months.	7'32 months.	4'26 months.	7'41 months.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

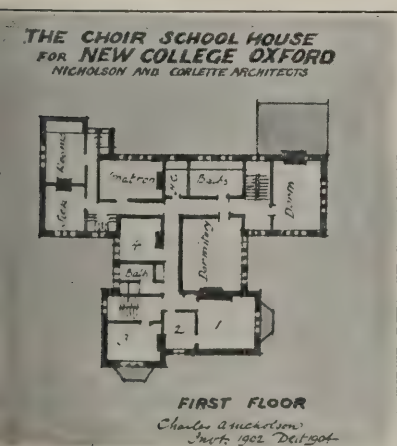


THE CHOIR SCHOOL HOUSE, NEW COLLEGE, OXFORD. NICHOL





& CORLETTE, ARCHITECTS. (Royal Academy Exhibition, 1905.)



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LIVERPOOL TIMBER TRADE.

(By our Own Correspondent.)

THE increased activity in the timber trade reported last month has been fully sustained, a good demand being experienced for builders' and cabinet-makers' woods. In builders' woods the local and country consumption of deals and boards continues active. The large mill-building operations in the Manchester district, the building of the Stockport Town Hall, and the erection of shop and residential property in many places in the district, is now proceeding vigorously; and more or less timber, chiefly for roof and floor work, with a necessary quantum of round pole stuff for special building, is being used in connection with the operations. The dispatchings by rail from the Derby Road and Regent Road yards have therefore been considerable. The near approach of the time at which steamers will cease to carry deck loads of timber for the winter season, and the talk about the closing of the importing season, has had a hardening effect on prices, and has given rise to free speculations as to the quantity of spruce which will be coming forward. There is no doubt, however, that spruce will continue to come forward freely, though perhaps not in large quantities, through being shipped as filling-out cargo, and taken readily enough by shipowners when more profitable freight is not at hand. The stock is slightly below that at the corresponding date of last year, but it is still considerable. As a matter of fact, the present stock would serve for a three months' consumption. Prices have been very firm, and seem likely to harden. Among the more recent arrivals in this department have been a consignment of 450 standards of pine deals from Montreal by Watson & Todd, a cargo of spruce by David Roberts & Co., pine deals and boards by Robert Cox & Co., and, in cut timber, consignments of flooring boards by Jonathan Gray. Whitewood has been in steady demand. Stocks, though not large, are quite equal to the consumption, and there has been a replenishing to a fair extent.

Framed woodwork continues to come to hand steadily. Among the important arrivals have been about 7,000 doors by John J. Swan.

Pitch pine.

The pitch pine market has been in a strong position, the demand for planks and sawn timber being good and steady, and the stacks of both kinds being smaller than at the corresponding date last year. Values are higher, mainly through the higher freights demanded at the ports of shipment. Stocks, though smaller, seem ample for present requirements.

Oak; Mahogany.

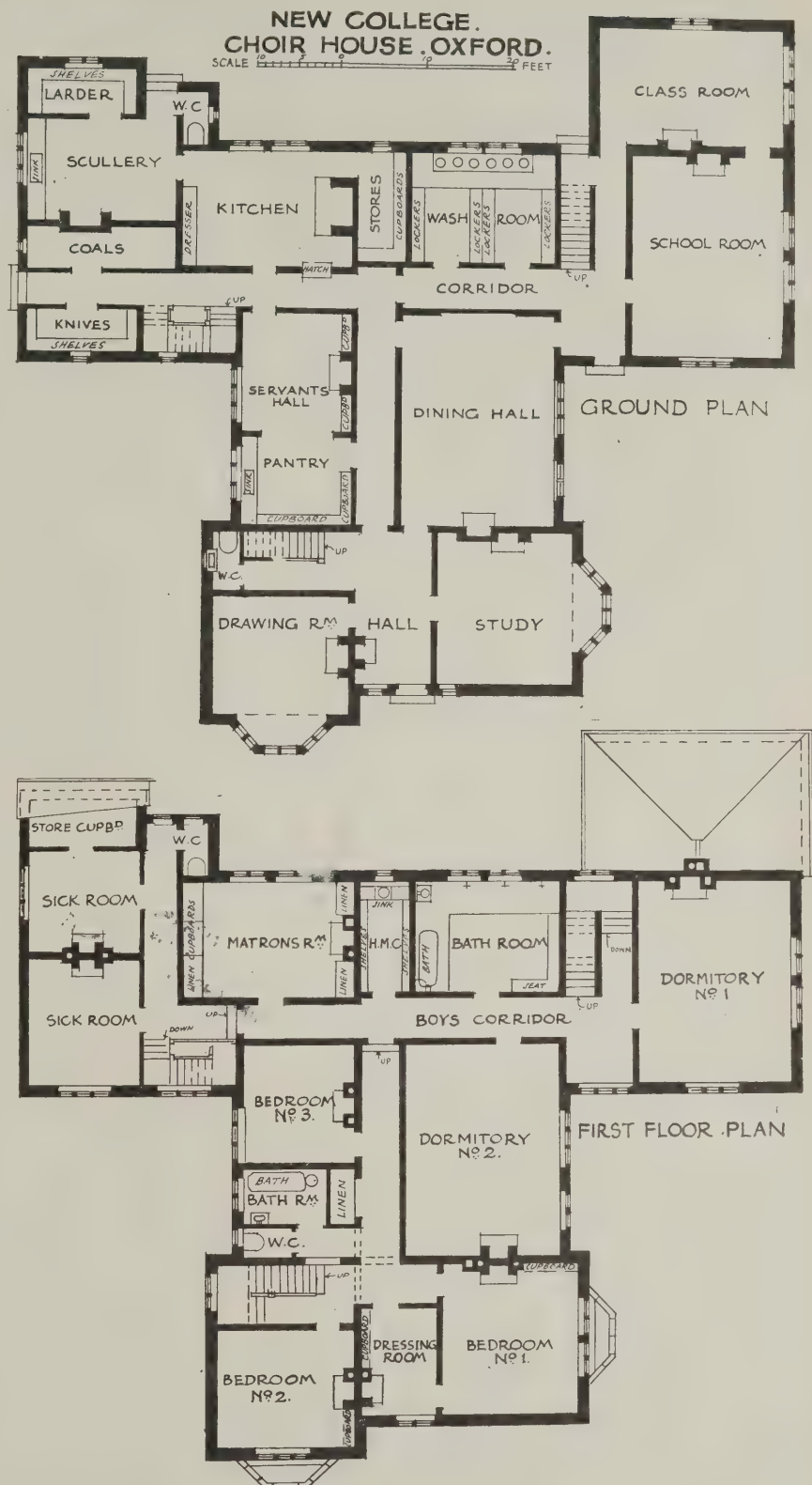
Oak planks have been in fair and steady consumption.

The sales of mahogany at the auctions held on October 19th and 20th were unusually large; 3,016 logs, representing 2,071,765 ft., being disposed of.

On October 19th the largest clearance was of Benin wood—about 606 logs—the price ranging from 2½d. to 1s. 5d. per foot. Lagos ranged from 2½d. to 8½d., and about forty logs of attractive Labou wood were taken up at prices ranging from 3½d. to 3s. 7d.

On October 20th the largest clearance was of Axim wood, 594 logs of this being sold at prices ranging from 2½d. to 1s. 9d. The event of the day, however, was the selling of a log of Grand Bassam, finely figured, at 6s. 1d. per ft. St. Domingo mahogany sold freely, 233 logs being taken at prices ranging from 3½d. to 10½d.

At Messrs. Alfred Dobell & Co.'s sale five logs of African walnut were offered and taken at prices ranging from 1½d. to 3½d. A consignment of teak, measuring 361 cub. ft.,



which was also offered, brought 1s. 7d. per cub. ft.

Cutting.

No sign of slackness has been noticeable at the Derby Road or Regent Road mills. The demand for wood on builders' account has kept the mills well employed, and they continue so at the present time.

The Musée des Arts Decoratifs is the latest addition to the public galleries of Paris. It is situated in the Pavillon de Marsan—the north-western block of the Louvre.

OUR PLATES.

THE choir schoolhouse for New College, Oxford, was completed in 1903 on a site just east of Wadham College Gardens. The walling and dressings are of Douling stone, and the roof is covered with hand-made red tiles. The schoolhouse contains ample accommodation for twenty-five boys, besides a master's residence. The work was carried out by Messrs. Benfield & Loxley, of Oxford, the architects being Messrs. Nicholson & Corlette, of London.

Keystones.

The Sanitary Inspectors' Association now has a membership of 1,053.

Change of Address.—Mr. Ernest Cannell, M.S.A., has removed from 18 and 19, Ironmonger Lane, E.C., to 51, Borough High Street, London Bridge, S.E.

The Welsh National War Memorial is to be erected on a site in Cathays Park, Cardiff, at the end of the avenue between the new town hall and the new law courts.

New Glasgow Premises.—New premises at 122 and 128, St. Vincent Street, Glasgow, for the Edinburgh Life Assurance Co., have been erected from designs by Mr. John A. Campbell, of Glasgow.

New Premises for the Preston Savings Bank are being erected in Church Street at an estimated cost of £25,000. The banking-room will be 60ft. square and 20ft. high, and the floor will be laid with india-rubber tiles. On the first floor will be a board-room 36ft. by 27ft. and departments for investment and new deposit accounts. Mr. Thwaites is the architect and Mr. Charles Walker the contractor.

Westminster Improvement Scheme Adopted.—At last week's meeting the London County Council adopted the proposal of the Improvements Committee to lease to the Victoria Embankment Syndicate, Ltd., for ninety-nine years, the whole of the surplus land from the Westminster improvement, at an ultimate ground rent calculated to produce 4 per cent. per annum on the cost of the improvement.

Chelsea Embankment Extension.—The Chelsea Borough Council decided last week to invite the London County Council to undertake the extension of the Chelsea Embankment from its present termination at Battersea Bridge to the "Cremorne Arms" public-house. Mr. W. D. Caröe, of Cheyne Walk, has written intimating that the proposal will be again strenuously opposed by local residents.

The new Church of All Saints, Ealing Common, which has been erected in memory of the Right Hon. Spencer Perceval, Prime Minister of England, who was assassinated on leaving the House of Commons in 1812, was consecrated by the Bishop of London last week. The church stands in the grounds of Mr. Perceval's former residence, and has cost £13,500. Mr. William A. Pite, F.R.I.B.A., was the architect.

A proposal by Mr. Bodley.—As a solution of the difficulty of future interments in Westminster Abbey, Mr. G. F. Bodley, R.A., calls to mind the "Campo Santo" at Pisa, and suggests that the space in Dean's Yard, now surrounded by iron railings, might be treated in some such manner. "Externally there could be four walls, and within them a wide cloister-like building, the inner walls having many glazed windows. The four long blank walls would afford much space for the monuments of many coming years. There could be four arches into the cloister with bronze gates and a cross walk."

An Amalgamation.—Messrs. Orenstein & Koppel, of Bush Lane House, Cannon Street, E.C., have amalgamated with Mr. Arthur Koppel, maker of tipping wagons, concrete mixers, &c., and the combined business of the two firms in the United Kingdom is now carried on under the style of Messrs. Arthur Koppel at 27, Clement's Lane, E.C. The staff of both firms has been retained, and standard types and sizes of all plant previously supplied by either firm, as well as spare parts and fittings for renewals or repairs, will be stocked for immediate delivery. The total combined paid-up capital of the two firms is £1,100,000.

New Episcopal Palace.—The Bishop of Southwell (Dr. Hoskyns) has decided to build an episcopal house at Southwell. The cost of the building, plans for which are now under consideration, is estimated at about £12,000.

The Further Strand Improvement Committee resolved last week to make another appeal to the London County Council to set back the northern frontage of the 'Strand' "island" east of the Gaiety block in order to give the roadway its natural course direct to the Law Courts and bring the thoroughfare into alignment with the church of St. Mary-le-Strand.

The Gladstone Monument in the Strand, close to St. Clement Danes Church, was unveiled on Saturday by Mr. John Morley. In the architectural details Mr. Thornycroft, the sculptor, had the assistance of Mr. John Lee. The bronze casting has been done by Messrs. Singer, of Frome, and the masonry by Messrs. Adamson, of Putney. The monument rests upon a bed of cement-concrete 19ft. thick.

New Municipal Buildings at Tottenham were opened on Thursday last. They include a town hall, municipal offices, public baths, fire-station, coroner's court and mortuary, and a depot. The cost has been £70,000. The architects were Messrs. Taylor & Jemmett, and the builders Messrs. Lawrence & Son, of Tottenham. The engineering plant was supplied and erected by Messrs. Ashwell & Nesbit, Ltd., of London.

The Old Parliament House Hall in Edinburgh has been restored under the direction of Sir James Guthrie, P.R.S.A. The old oak roof has been cleared of all varnish with the aid of chemicals and the natural colour retained: while the carved stone corbels have had the paint and gilt removed. A new floor in large squares of oak and teak has been laid, and the walls have been treated so as to represent stone colour.

The new Building of the Working Men's College in Crowndale Road, St. Pancras, has been opened for classes, although it is not yet completed. It has been designed by Mr. W. D. Caröe, and will contain, in addition to a hall seating 400 persons, a large library, museum, gymnasium, common and coffee rooms, an art room, and a large number of classrooms. A special feature will be the laboratories for chemistry, physics and botany, which are not intended for technical instruction but for scientific study.

The new City Hall at Belfast is nearing completion, and May next is spoken of as a likely month for the formal opening. The architect is Mr. A. Brumwell Thomas, F.R.I.B.A., of London. The foundation-stone was laid seven years ago. The building has a frontage of 305ft., with a depth of 240ft., and its total cost is stated to be £350,000. Rich marbles have been used profusely on the interior. The council-chamber is 80ft. by 40ft., with a large reception-room adjoining; the banqueting hall will accommodate between 300 and 400 people, and the public hall is 113ft. by 57ft.

Widening of Blackfriars Bridge.—At last Thursday's meeting of the City Corporation it was decided to promote a Bill in Parliament for powers to widen Blackfriars Bridge to an extent not exceeding 40ft., the Bill to be comprehensive enough to enable that corporation, if necessary, to round off the north-west corner of the bridge. The proposal is conditional on the London County Council obtaining powers to run trams over Westminster and Blackfriars Bridges and along the Embankment. It is proposed also to construct a subway for passengers under the roadway at the northern end of Blackfriars Bridge.

The R.I.B.A. Kalendar for 1905-1906 has just been issued, price 2s. 6d.

Holy Trinity Church, Exmouth.—The foundation stone of the work of restoring and enlarging this church was laid recently. Mr. G. H. Fellowes Prynne is the architect. The cost of the work will be £6,092.

The Greenwich Central Library, at the corner of Woolwich Road and Tunnel Avenue, was opened on Saturday by the mayor (Mr. Donald McCall). For the building of this and a branch library Mr. Andrew Carnegie gave £13,000. Mr. Sydney Smith, F.R.I.B.A., was the architect.

Builders' Notes.

Rolled Steel Beams 24in. high by 7½in. flanges, by 100 lbs. per foot, are now being rolled of Siemens-Martin steel (acid process) at the Lanarkshire Steel Works. This section is No. 30 on the British Standard Beam list, and is the largest steel section at present rolled in Great Britain.

A Meeting of Creditors of William Winnard, builder and contractor, Wigan, was held in Liverpool on Friday last. The statement of affairs showed total liabilities £10,947 and nett assets £10,556, leaving a deficiency of £391. As the debtor expects to be able to obtain an advance of £5,000 from friends, the meeting was adjourned for a fortnight so that some definite proposal may be laid before the creditors.

Partitions in an Actual Fire.—A few ago a fire broke out in the "Telegraph" weeks Chambers, Market Street, Bradford, in a room almost in the centre of the building, but all the floors and partitions were of fire resisting construction, the latter being supplied by the Fireproof Plate Wall Co. of Bradford and London. The fire did not spread; although the room was completely gutted, the adjoining rooms were untouched by fire.

The Effectiveness of "Uralite" as a Fire Stop.—A fire occurred recently in a cottage at Colwood Hill, Bolney, Hayward's Heath, caused by the composition which workmen were using in laying floor blocks becoming ignited. At one time the fire looked serious, but "Uralite" ceilings had been fixed in the cottage, and they effectually prevented the fire reaching the floor above, otherwise the fire would certainly have burnt the cottage to the ground, and might have destroyed a good deal of property adjoining.

Messrs. Spencer, Santo & Co., Ltd., despite the fact that the building trade has not been particularly flourishing of late, appear from the interim dividend announcement issued last week to have done much better than during the corresponding six months of last year. The rate declared for the past half year on the ordinary shares is 8 per cent. per annum, which is an increase of 2½ per cent. on the rate for the first half of 1904. This suggests that at the end of the year the firm may establish a higher level for its annual distribution than the 10 per cent. which has been paid for the past three years.

Scottish Building Trades' Federation.—The annual meeting of this federation was held recently at Inverness, the chair being occupied by the president, Mr. William Macdonald, carpenter contractor, of Inverness. The report stated that the finances of the federation were now on even a better footing than when the year began, but the executive much regretted that the state of trade throughout the country continued dull and depressed. There was, however, some reason to hope that the tide was now turning. Mr. P. Knox, plumber, of Edinburgh, was elected president for the ensuing year, and Mr. James Cameron, solicitor, of Edinburgh, was appointed secretary.

Law Cases.

The Employment of Day Labourers on Building Work.—An important building trade case was heard by the stipendiary magistrate at the Manchester City Police Court last week affecting the employment of day labourers. The defendants, Messrs. Redston & Co., plasterers and painters, were sued by three labourers, members of the Manchester and Salford Operative Plasterers' Labourers' Association, for a sum of about 8s. each as payment for the time they were kept waiting for their wages. Mr. Merriman, for the complainants, stated that the men were engaged at the rate of 7d. an hour at the new Manchester fire station, on which building the defendant firm had a sub-contract. On Thursday, October 12th, they were told to "stand down" owing to the supply of material having run short. The men asked to be paid for the work they had done, but this was refused and they were told they would have to wait. Between Thursday and Saturday they went several times for their wages, but did not get them until noon on Saturday, when the amount handed to them did not include the time they had been kept waiting. Mr. Merriman said the case was brought under the Employers' and Workmen's Act, 1875, and the Association to which the complainants belonged regarded the matter as important, because a question of principle was involved. It was a rule of the Association that men after receiving notice were either to receive the wages due to them or be paid for the time they were kept waiting. The stipendiary asked whether the men, having been told to "stand down," were still in service of their employers, or whether they were at liberty to seek work elsewhere at once. In reply Mr. Judson, for Messrs. Redston, stated that the men were not really dismissed by being told to "stand down," but before they could leave there must be notice given. The stipendiary asked what would be the position of a man who went to look for another job immediately on being told to "stand down"—would he be liable to be sued for breach of contract? Mr. Judson said he supposed that the man would be technically liable, but no such proceedings had ever been taken. Witnesses were called for the defence, and one of them who had spoken of frequent stoppages because of frost and rain admitted in answer to Mr. Merriman that in such circumstances the men had little chance of getting employment elsewhere, and would simply wait for a resumption at the same job. In giving judgment for the complainants for the amount claimed the stipendiary said that even on the evidence for the defendants the labourers would have been entitled to seek work elsewhere on being told to "stand down." It seemed to him that, according to the rules of the Association, if a man insisted on it, he had a right to be paid at once or be compensated for the time he was kept waiting. He gave judgment for the complainants for the amount claimed, and in addition their expenses for attending court.

A Bradford Architect and his Pupil: Amusing Case.—At the Bradford County Court last week, before his Honour Judge Bompas, James Edgar Adamson (aged 18), suing through his father, Mr. James J. Adamson, architect, of Hull, brought an action against Mr. H. E. Priestley, architect, of Bradford, to recover damages for breach of an indenture of apprenticeship. Defendant counter-claimed for £50. On behalf of the plaintiff it was stated that Mr. Priestley, in consideration of a premium of £52—half to be paid down and half at a subsequent date—agreed to take the plaintiff as an articled pupil, and indentures were signed for four years from September 1st, 1903. After a few months the plaintiff found that he was

not making satisfactory progress in the defendant's office, where there was very little to do, and where he was nothing more than an office boy. In consequence of representations made to his father, the latter, when the second half of the premium became due, paid only half of it, and correspondence ensued in which the defendant met Mr. Adamson's complaints by counter-charges against the plaintiff. Eventually the plaintiff went home to consult his father, and the defendant wrote saying that he would not receive him back.—The plaintiff, in evidence, said that when he went to Mr. Priestley's office there was one assistant and himself. The assistant subsequently left, and Mr. Priestley took another pupil. There was never much to do, and during the last year business was very slack. Witness had to do tracing and office-boy's work—copying and posting letters, copying insurance policies and collecting premiums. He had very little instruction in the preparation of plans, and was not taught to get out specifications or quantities, though he several times asked for instruction in these departments.—The defendant said that during the time plaintiff was with him he had so much work that his health broke down several times. He had in hand a great many buildings in Bradford, and numerous drawings for architects up and down the country. He had no complaint to make as to the plaintiff's ability. The plaintiff was able when he was willing, but he was not always willing. Moreover, he was guilty of "gross wickedness" from February, 1904, onwards. Defendant computed roughly that plaintiff had done about £20 worth of damage in the office to instruments, drawing-boards, T-squares and writing-tables. Nearly every piece of furniture in the office was disfigured with grinning faces, Union Jacks, soldiers' helmets and a hundred other devices. Plaintiff had also made personal statements, and at an examination had misstated his age, and had sold his exhibition ticket—"a perfectly illegal thing to do."—Mrs. Priestley, the defendant's wife, gave evidence as to the damage done



ACTON WESLEYAN CHURCH. REGINALD T. LONGDEN, ARCHITECT.

This is a small country church with seating accommodation for about 120. It consists of nave, vestries, stores and lavatories at rear. The building is built of sand-faced stocks (of a cherry-red colour), with wide mortar joints, stone dressings and red tile roof. The outside woodwork is painted white, and inside light green stained and varnished pine; glazing, lead lights. The main gable is cement rough-cast, distempered ivory white. The general contractor was Mr. S. Wilton, junr., of Newcastle-under-Lyme, and the architect Mr. Reginald T. Longden, of Burslem.

by the plaintiff at the office. Among other things, Mrs. Priestley said he was in the habit of letting lead weights drop on the floor, which she believed was done to annoy her in the room below.—His Honour reserved judgment.

Heavy Claim against Dublin.—At Dublin last week an action was heard in which Messrs. Pearson & Sons, contractors, of London, sued the Corporation of Dublin for £36,374 in connection with the city outfall and purification works at North Wall. It was stated that the claim was owing to the carelessness of the corporation in stating that the harbour wall was watertight where the works were to be erected. It was found that the walls were only of dry stone, and to carry out their contract Messrs. Pearson had to incur the expense which constituted the claim. Judgment was given in their favour.

An Architect's Claim.—At West Bromwich County Court last week, before Judge Smith, Mr. S. E. Siddaway, architect and surveyor, of West Bromwich, brought an action against Mr. H. W. Haynes, rope and twine manufacturer, Birmingham, for £9 9s. for professional charges. The case for the plaintiff was that he was engaged by the defendant to survey and plot out some land in Nineveh Road, Birmingham, and also to prepare plans and tracings of a house and outbuildings. These, together with 2½ per cent. commission on an estimated sum of £369, brought his charges up to the amount claimed. Defendant pleaded that he only engaged the plaintiff to provide a pencil sketch, and that it was impracticable to put a house of the value of £369 on the land. The whole scheme was too elaborate. The judge gave a verdict for the full amount claimed, with costs.

New Baptist Church and Schools, Wavertree, Liverpool, have been erected from designs by Messrs. George Baines & Son, architects, of London, at a cost of £8,693. The church seats 775 persons, the seating being circular on plan, and is arranged for future extension by galleries to seat over 1,250 persons.

R.I.B.A.

MR. BELCHER'S PRESIDENTIAL ADDRESS.

THE opening meeting of the session of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the chair being occupied by the president, Mr. John Belcher, A.R.A.

Mr. Alex. Graham referred to the losses of the Institute by death since the last meeting, and proposed that a letter of sympathy should be sent to Mrs. Waterhouse and family expressing heartfelt sympathy with them in their bereavement and appreciation of the late Mr. Waterhouse's excellent work, the many monuments of architectural art which he had left behind him, the many acts of kindness shown to members, and the great interest he took in the Institute.

Mr. Graham also proposed that a letter of sympathy be sent to the widow and family of the late Mr. Charles Forster Hayward expressing appreciation of the services he rendered to the Institute, and of his worth and merit during a long and active career.

The secretary announced that the following had passed the examination held last November qualifying them to practise as district surveyors under the London Building Act:—A. A. Fillary, E. W. Knight, E. Palser, H. T. B. Spencer, A. L. Woodward; and that Mr. W. J. Stainton had been granted a certificate of competency to act as a building surveyor under local authorities.

Mr. Belcher then delivered his presidential address. After referring to the confidence and goodwill of his brother architects, to which he was indebted—"a source of no small encouragement to me, in view of the difficulties likely to attend on my position as president during the period upon which we are now entering"—Mr. Belcher said their membership had increased considerably during the past year, partly no doubt to the determination of the Institute to close its doors against all who had not passed a qualifying examination. But their losses, too, had been numerous, including

Mr. Alfred Waterhouse, R.A.,

to whom Mr. Belcher referred as veritably one of the giants of our days, and that it might fairly be claimed for him that he developed a phase of art—consistently followed to the last—as peculiarly his own as that of the brothers Adam was characteristic of them in another direction.

Regent Street Quadrant.

Proceeding to deal with the public works in London to which he had referred in his address last year, the president said they were rapidly approaching completion, and in the City the Old Bailey buildings were progressing well. The pulling down of a large portion of the Regent Street Quadrant had been the occasion of considerable anxiety, the more so because buildings recently erected on other Crown property near by exhibited a total disregard for their surroundings, and indeed for any general scheme such as that devised by Nash, to which Regent Street owed its peculiar character and value. The present officials, however, recognizing the mistake made in the past, had determined to use their powers to retain a uniform treatment of the Quadrant at least. The need for such uniform treatment was so strongly felt by architects that had it not become known that Mr. Norman Shaw had been engaged upon a design of a façade for all the buildings in the Quadrant, there would have been a general outcry. Mr. Belcher said he had reason to believe now that, thanks to the wisdom of the authorities and the compliance of the County Council, to whose architect we owed much, in respect of such portions as were under their control, there would be achieved a memorable work

and a noble termination to Regent Street worthy of a great city.

Mr. Belcher next referred to the proposed new Wesleyan Hall in Westminster, remarking that the successful architects, Messrs. Lanchester & Rickards, were run very close by others, the design of Messrs. Cross & Mallows in particular presenting many delightful features. He then spoke of

The important new Buildings at Cardiff.

where again Messrs. Lanchester & Rickards were very much in evidence. The town hall and law courts promised to be amongst the most successful buildings of our day. Simple in plan, convenient in arrangement, fine in scale, decorated with just the proper amount of ornament, they would combine with the new university buildings by Mr. Caröe, the library and museum by Mr. Seward, and a small but excellent building by Mr. Wills, to form a remarkable group—situated in beautiful park-like grounds—of which Cardiff might well be proud; and by the far-seeing liberality of the authorities the architects of the municipal buildings had been enabled to avail themselves of the assistance of some of our best sculptors in giving force and expression to the buildings.

Mr. Belcher next spoke of

A new Official Home for the Institute.

Owing to the increase of official work, the growth of the library, and the need of more space for the exhibition of students' drawings and the display of their many treasures, the premises in Conduit Street were daily proving more inadequate, and as they could not be extended the council had been compelled to look elsewhere. After many fruitless enquiries and attempts, they were now prepared to recommend the acquisition of a fine freehold site which had been found in Portland Place—the matter having been considered by a special committee of past presidents, as well as by the council and the finance committee.

The Architects' Benevolent Society was next spoken of, and an appeal made for subscriptions, as the amount received was totally inadequate to meet the deserving cases which should be relieved.

Competitions.

Dealing with this subject, Mr. Belcher said: "Every assistance has been rendered to public bodies who have sought for information or advice, and it is now the almost universal custom to request your president to nominate an assessor in competitions. In such competitions I note that the regulations issued by the Institute are generally adopted; but it would be greatly to the advantage of all parties concerned if, whenever it is proposed to introduce a variation or insert a special clause, such variation or special clause were first supervised by the assessor. The latter is bound to insist upon the conditions laid down, and any vagueness or uncertainty in technical details—often to the lay mind of no seeming importance—is apt to prove exceedingly unfair to competitors."

"It is of great importance also that public bodies, while reserving to themselves the right of confirming the assessor's decision, should be very slow to override or pass it by. Only a man of considerable practical experience and training in architectural work can lay his finger upon the impracticability or carefully-masked faults which mar the designs of so large a proportion of competitors; and to think that it is sufficient for a layman or any body of laymen to know 'what they like' (to use an expression often heard in such matters) is almost to set a premium upon work which is showy but intrinsically bad. It is the duty of this Institute to lead the way in discerning and approving all that is good and pure in architecture, and to recognize, and so far as

possible reward, those qualities which ensure the best results.

"The want of discrimination shown in some official and other circles, particularly in the provinces, lends much force and point to the demand for the registration of architects as being one way at least of counteracting the injustice so often done to competent men."

Registration.

Of this Mr. Belcher said: "The committee appointed by the general body to consider the principle of registration has now reported and gone so far as to suggest a form of Bill in Parliament. There is, however, considerable diversity of opinion still, and it is scarcely possible that the Bill should pass into law. Yet some remedy must be found for the present evils; we cannot be indifferent to the interests of the many able men upon whom existing conditions press so hard. Your new registration committee has therefore already appointed a sub-committee to examine impartially into the whole question. This committee, which is composed of men holding diverse, even opposite, views, is to receive and consider the evidence of those, whether members of the Institute or not, who may be either in favour of or opposed to compulsory registration, or who have suggestions of any kind which may help the committee to formulate a scheme which they can recommend. And any of the members in the provinces who may wish to offer suggestions or furnish evidence should communicate with the secretary as soon as possible. This should not occupy any great length of time; but what is done must be thorough, and we must arrive at a final solution of the question. Should the committee find it desirable to promote a Bill in Parliament, we must not risk failure or court defeat by presenting one which, owing to the opposition it arouses, has no chance of passing."

Proceeding, Mr. Belcher said the coming year would mark an epoch in the history of the Institute, for at its close only those who had qualified for the ranks of the Associates would be elected to full membership. Ample provision would be made for the needs of those who thus sought to qualify, and all the necessary educational facilities would be complete.

The Education Question.

"The Institute intends to take up this question on the basis laid down by the Board of Education and to give it its full support, and I am glad to be able to announce that this being so I have received an intimation from some twelve well-known architects that they are willing to join the Institute and work with us in advancing by every means in their power this most important question of architectural education."

"The new Board of Architectural Education formed for this purpose has, after long deliberation, issued a report which has been approved by the council and by all the educational bodies interested. The aims and methods proposed for adoption were admirably set out at one of our meetings by Mr. Reginald Blomfield, A.R.A., one of the hon. secretaries. The board is constituted on a very broad basis, its advisory members, for instance, including representatives of the Royal Academy, the Universities of Oxford, Cambridge and London, the Board of Education, the London County Council, University College, King's College, the Universities of Liverpool and Manchester, University College, Cardiff, the Architectural Association day school, and the architectural schools of important centres in the country. All these have consented to the proposed scheme, and the co-ordination of the work in the several schools is agreed upon. The importance of the advance thus accomplished can hardly be overstated."

The Certificate of the Board of Architectural Education.

"A certain definite standard and right method of architectural training being thus established, it follows that in due course the board's certificate will form a very valuable asset in the portfolio of the rising architect. However desirable it may be that the style and title of architect should be limited to duly qualified men, it does not seem possible for us to do more at present than undertake to certify that the men who pass through the board's curriculum and obtain the certificate are acquainted with the essentials of our art and possess certain definite qualifications. The test thus imposed will be a valuable one, not only in the interests of the public but also of the students themselves. The latter for the most part recognize their obligation to fit themselves for their work, but the natural impatience or perhaps conceit of youth leads some to think that for them at any rate there may be a short cut to success and fame, forgetting the old adage, 'There is no royal road to learning.'

"Then the question arises, Ought not those who have submitted to an arduous course of training and passed severe tests to be distinguished in some special manner? And this is now under consideration. In future those who possess a certificate of the Board of Education will certainly be exempted from some of the Institute examinations, though the final examination for membership, and that probably in a modified form, may be reserved; and we may, I think, be sure that the growing power of this Institute as the representative body will bring to its members, according to their grade, whether Fellow or Associate, not only increasing kudos but an ever-larger share of the greatest and best work that may be called for in our art.

An Architectural Primer for the Public.

"The education of the public in the elementary principles of architecture claims our attention at the present time. I know that this idea is regarded by some as Utopian, but at any rate there is abundant evidence that people generally take more interest in the subject than they used to. A committee was appointed last session to consider whether anything could be done in this direction, and they came to the conclusion that certain proposals laid before them were not only practicable but capable of an extensive application. A 'standard work' issued by the Institute, and directed not so much to the training of the professional student as to furnish information which might with advantage form a part of every educated person's intellectual equipment, would prove of use, not only to the public generally but also to school teachers and others interested in education.

"This question—The Education of the Public—together with that of a diploma for architects, and the best methods to be adopted in the laying-out of cities, will engage the attention of

The International Congress

which is arranged to meet in London in the third week of July next year. This will be the seventh such congress and the first held in London. On previous occasions, for the most part, the Congress has been aided by a State subvention; for foreign Governments are alive to the importance of such events from the point of view of the national interests. Our system of government not allowing of such support, we are thrown back, for the success of the Congress, almost entirely on our own enterprise and *esprit de corps*. An earnest appeal is therefore made to all members of the profession in this country to lend a generous aid in this matter, not so much by special donations—though the Executive Committee are by no means too proud to accept them—as by enrolling themselves members of the Congress, whether they see their way to taking part in it personally

or not. I anticipate that the International Congress will go far to open the eyes of the public to much in their own land that they have not hitherto valued at its true worth."

Street Architecture.

Referring to the question of our street architecture in its hygienic aspect, and the Traffic Commission, Mr. Belcher said that the formation of new main avenues and the widening of important thoroughfares to provide greater facilities for locomotion and transport implied new building frontages; and the façades which were thus to be in the public eye, as it were, for many long years to come ought to be under proper control from the very first. The owners of land bordering on a public thoroughfare ought not to be at liberty to indulge an ill-regulated fancy for what was bad and false in architecture or vulgar and showy in appearance.

In some countries—for instance, Germany and the United States—State interference had been invoked to regulate the "extension of cities," and he was glad to note that the authorities were seriously considering the advisability of similar legislation in respect of the suburbs of London. The attention of the public had been somewhat diverted from this larger subject to what was relatively a minor detail, namely, the character of the small villa residences; but the interest taken in the so-called "garden cities" was evidence of an awakening to the importance of a graduated increase of air-space in proportion as the buildings receded from the centre of the city.

He emphasized the view that the laying-out of such avenues and thoroughfares was not entirely and solely a matter for the engineer and borough surveyor. The architect, and in certain cases the painter and sculptor, might with great public advantage be called in to collaborate with them. It was not the best way in such a matter to take an Ordnance map and rule a straight line from one point to another. Yet such was, in essence, the course frequently adopted; and should any important building or object of interest come in the way, the engineer had little regard for it. There was a great deal more to be determined in connection with a new thoroughfare than the most direct route, the necessary gradients, the sanitary and hygienic requirements, &c.; there were artistic possibilities to be taken, as it were, into the public service, such as the opening up of suitable vistas, the bringing into prominence or the screening of existing buildings, the slight turning from the straight line to heighten the effect, or provide places for carriages to stand out of the line of traffic.

"In the absence of a Minister of Fine Art with duly qualified advisers, an Art Commission similar to that which has been established in New York has been suggested. The Commission referred to has jurisdiction over all designs of municipal buildings, bridges, approaches, gates, fences, lamps, the lines, grades and plotting of public ways and grounds, arches, structures and approaches, and other similar matters. It must be admitted that such powers as are here indicated can only safely be placed in the best and most capable hands.

"I believe, however, there is a better time coming. It is noteworthy as one passes through the country what an increasingly large proportion of the smaller class of houses have evidently been designed by architects. The builder is discovering that an architect's design is not an expensive and unnecessary luxury, but that the initial outlay is more than repaid, if not in the actual building of the house—and this often happens—at any rate in the improved letting which results. I cannot help remarking too upon the advantage which is certain to accrue to the architect himself in the process of studying and designing

small houses. It certainly is not very remunerative work, but it has its compensating rewards. Any real advance must no doubt begin in small things before there can be a true appreciation of greater work. As the true qualities of architecture should be equally seen in small as in large buildings, they may perhaps be more easily grasped and understood by way of the less complicated problems. Increasing knowledge will add to the number of those who appreciate and desire good work, and their sensitiveness in matters of taste will incite the producers to higher efforts, so that by action and reaction our native art will approach a higher level. Let us seek not merely to fan the growing interest in our art, but also to awaken a clear perception of its true qualities. It will not be long, I venture to prophesy, before public opinion will declare itself definitely and decidedly, insisting upon grace and refinement both in our public buildings and our important thoroughfares. Given such an opportunity, we may feel confident that our national architecture will not fail under the test, but will reflect the highest and noblest qualities of our race."

A vote of thanks to the president was moved by Sir John Thornycroft and seconded by Sir Arthur W. Rücker.

Trade and Craft.

Underlining for Roofs.

It is very necessary that there should be some protective covering underneath slates or tiles on a roof. Of course there are circumstances where not even boarding, or indeed pointing on the inside, is necessary, such as in the open roofs of cart-sheds and farm buildings, &c., but our present remarks are intended to apply to a roof where boarding is considered of importance. When this is used it is insufficient alone. There must be some damp-proof covering between the slates or tiles and the boarding, the reason being of course that the slates or tiles cannot be pointed on the underside so as to exclude moisture (it is obviously undesirable to bed them in mortar); and, as rain will drive up underneath and carry dirt with it, if there is no protection a roof will remain damp for a long time after wet weather, on account of the moist paste underneath the slates or tiles. Anyone who has had to deal with the repairing of a roof knows the horrid mess there is in such cases. Naturally if this moisture is allowed to penetrate, rotting must result. The only remedy is to use a waterproof covering. Now, whereas a lining paper may be very useful for an open roof where the tiles or slates are placed direct on the battens, without underboarding—because is a cheap method—it becomes illogical to do so (though, nevertheless often done) on a roof which is boarded, because in this latter case it is apparent that cheapness is not so much studied as efficiency. A roof which is intended to be covered in the best way needs to be protected against heat and cold, which boarding partially does. The ordinary lining paper is of little use in this respect; a much thicker and more non-conducting material is required, such as felt. The ordinary indurated bitumenized roofing felt is not sufficiently satisfactory. It is not particularly non-conducting, and if it is not efficient in this particular it loses its *raison d'être*. We have had our attention called, however, to a very good felt which has been placed on the market by Messrs. Engert & Rolfe, Ltd., of Poplar. This is a bitumenized hair-felt of special character, with very very considerable non-conducting properties. At the same time it is an extremely good sound-deadener, and will be found of considerable service in flooring and in partition work, to take the place of pugging.

NOTES ON VENTILATION.*

By F. ALDOUS.

A VERY great deal in the science of ventilation has been manufactured out of nothing—by that I mean theory. Theorists tell us this must be the case, or that another thing cannot be, because it is compatible with or contrary to given forces. No one will deny that there are natural laws which will assist ventilation, but to depend upon them, as many do, is simply ridiculous, and it is equally foolish to attempt to baffle natural forces.

Of the two general systems of ventilation, "natural or automatic" and mechanical, the former is usually (but not always) considered the most economical, and the latter the most effective.

To bring about the constant changing of the air, inlets as well as outlets are required to every room or compartment, and these appliances should be used with extreme care, otherwise it will soon be discovered that practice will in this case, as in most others, upset the theory laid down as to given laws.

Dealing with the outlet first, I fail to see how there can be such a thing unless it is absolutely proof against down-draught, as it cannot admit the cold air from the outside (which many so-called ventilators do, thus causing a down-draught) and at the same time extract the hot or vitiated air from the inside. All outlets, whatever form they may take, should be placed at the highest point of the place requiring relief; and too much dependence should not be placed upon the apparatus used.

There are very few automatic ventilators with any extracting power. The majority are not extractors, but intakes of wind and air except under very favourable circumstances. The apparatus used cannot be too simple in its construction so long as it is effective. It has been proved in many ways that a rotary cowl is no assistance to ventilation.

When applying fresh-air inlets great care should be taken as to the position in which they are placed, or they will have a destroying effect upon the extractor, or, maybe, a deleterious effect upon the occupants. They should be placed above the height of any person who may be standing near them and also below the lights. If placed above the lights from which the heat or vitiated air is thrown off, there will be the same effect as if air were coming into the extractor; for the cold air coming in above the hot air, or the heavier above the lighter, will cause the latter to fall instead of to rise and escape at the place where provision is made. By placing the inlets below the lights, or hot air, they will act as a help to the hot air in rising.

Changes of air can be brought about automatically if the appliances are correctly placed; but sometimes they are so placed that they have a direct contrary effect to that intended. Let me quote an instance. A short time ago my father and I were requested to test the ventilation at a Wesleyan chapel. We found the following conditions and results:—On the roof were three large ventilators as extractors (so-called). On the north side of the building were five Tobin tubes, and on the south five also. The wind was blowing from the south, at a velocity of from four to five miles per hour. On testing the inlets (or Tobin tubes) on the south side we found there was an inlet of fresh air of 6,000ft. per hour through each tube. We then tested those on the north side, which were sheltered from the wind, and found they were extracting at the rate of 4,000ft. per hour through each tube. Where the inlet or intake was, it was more of

a forced current than the bringing-in of fresh air, in the true sense of the word, because the wind was blowing directly into the collecting bonnets of the air tubes. Now, if the forced current is deducted from the natural inlet of fresh air—as it should be—these inlets, taking them as a whole, were perfectly useless: the reason being that the ventilators and inlets were not working together or helping each other, but quite the reverse, for the so-called exhaust ventilators were acting as inlets, thus bringing down volumes of cold air high above the Tobin tubes. The air thus brought in being more powerful than the air inside, caused a displacement of the existing air, and so forced it out at the inlets. It will thus be seen that inlet ventilators do not always act as inlets, and, therefore, care should be taken in applying them.

Again, when more than one inlet is used in the same room a great mistake is often made by not placing them at the same height; if they are not so placed one will act contrary to the other.

Another great mistake is made with respect to fresh air, and very frequently by architects. This is by such apparatuses as fans, punkahs, water-sprays or any other moving apparatus supposed to create air. The water-spray or fan simply displaces the surrounding air and on its amalgamation produces a cooling effect. That is all. Water-sprays or fans are of no assistance to ventilation in the way which ventilation should be brought about; neither by creating nor bringing in fresh air are they of any use.

No automatic apparatus placed in a room at a temperature of 50 degs. Fahr. can draw in the outside air of the same temperature; if such were the case it would entirely destroy the theory of spontaneous diffusion of two columns of air by their unequal density.

If a room is tested with fifty people in it the temperature will be found to be lowest at the floor line. To reduce the weight and increase the temperature, cold air should be brought in above it. This may appear strange, but it is so. If openings are made in the room 1ft. or 15ins. above the floor line to admit fresh air, and a thermometer is placed 1ft. above the floor line, the mercury will rise, even if the air admitted is colder than the general temperature of the room.

To deal with the carbonic acid gas, collecting bonnets should be placed under the floor; and connected with them should be tubes conducted up behind the stove; the ends which discharge the gas should be somewhat below the fire, so that the heat will destroy the acid, reduce it in weight, and so help it to rise and escape up the chimney flue. This is a way the heavy gas can be effectually dealt with, and it will also show how effectually a change of air can be brought about either by natural or mechanical means.

Of the lighter gas, sewer air is, of all others, the most dangerous, while still more deadly is carbonic oxide, though not nearly so dangerous or so much to be feared as either of the other two gases, inasmuch that there is always a warning with it—it being made by fire.

I am very sceptical about the ventilating powers of the ordinary types of fans. Let us look at some of their names—the air propeller, the cyclone, the blast, the hurricane, and various other names signifying their capabilities; but if they were called air churns it would be more appropriate; for displacing the existing air and causing a powerful wind is not changing the air, and unless the apparatus employed has a perfect and complete contact with the object it is required to move, the results aimed at cannot be attained. On the other hand, if the apparatus is applied and carried out scientifically, then mechanical ventilation can be made a success.

All the supplies to be moved, either as

intakes or outlets, must be connected to an accumulator or collector; and the accumulator to the fan or fans, and all parts being perfectly airtight, the contact is brought about, and thus it operates. Every space is full of air, and no more can come in until some is moved out.

THE SIXTH CAMPAIGN AT KNOSSOS.

Discovery of a "Little Palace."

IN the "Times" of October 31st is a long article by Dr. Arthur J. Evans recording the results of the sixth campaign of excavation on the site of the wonderful palace at Knossos, in Crete. The chief work of the year has been in tracing the paved Minoan Way leading from the palace to the hillside opposite. Here has been uncovered a "little palace" reproducing in its general style and arrangement the larger one to the east, and curiously repeating its history. Unfortunately it runs straight into the hillside at a considerable depth beneath an olive grove, and with the means at disposal it was possible to lay bare only its eastern section. A paved columnar court forms the approach to five spacious doorways of a large hall, divided by a second row of similar doorways—according to the Minoan system—into two sections. This hall was again flanked on its eastern side by another portico with column bases, so that we have an arrangement very similar to the Hall of the Double Axes in the domestic quarter of the palace. Adjoining was a small chamber recalling the bathrooms of the Cretan palaces, from the appearance of balustrades with column bases upon which wooden columns had originally stood. During the period of reoccupation, however, three of these had been backed and half their diameter embedded in a clay or rubble walling. So it came about that when, later, the wooden shafts themselves were destroyed by fire they left in the plaster of the wall behind them almost perfect casts of their embedded halves. A careful excavation of the chamber-wall thus brought out sufficient remains of these moulds of columns to illustrate what for the Minoan and "Mycenæan" architecture is a wholly new type. Columns of this period with the ordinary incave fluting—the prototype of the Doric—were already known, but in this case the fluting was in relief, a decoration obviously taken over from Egyptian columns imitating clustered papyrus stems or sheafs of reeds. The Nile is never very far off from Minoan Crete.

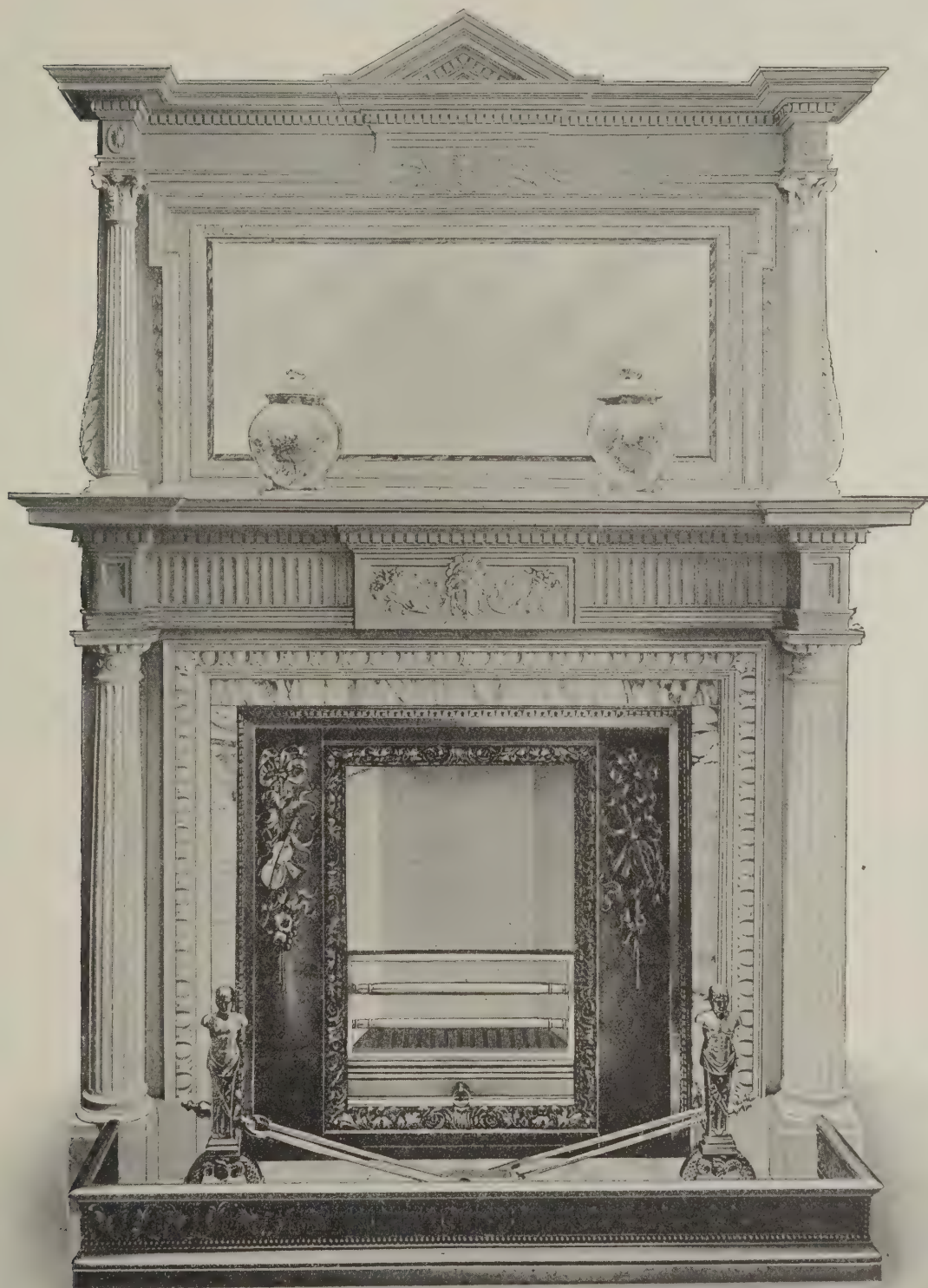
A new School at Bo'ness is about to be erected at a cost of £10,000. It will accommodate 1,000 children, in seventeen classrooms arranged around a central hall. The architects are Messrs. H. & D. Barclay, of Glasgow.

Linear Perspective Illustrated by Photography.—At the last meeting of the Glasgow Architectural Association Mr. Robert F. Sherar, a delegate from the Edinburgh Architectural Association, gave a lecture on linear perspective illustrated by photography. After hurriedly tracing the history of the subject from the conventional representations of the ancient Egyptians to the finished realism of the Middle Ages, he said that the researches of the science, as such, had been practically exhausted by Dr. Brook Taylor and successive writers in the eighteenth century, but it was always possible to improve on the methods of stating facts, and he thought that the illustration of perspective by photography would be something new. He then proceeded to show photographs of buildings taken from different points, illustrative of the angle of view, &c., and at the close of the lecture he presented to the Association's library a copy of his book "Perspective Tables" describing his methods.

* Extracts from a paper read before the Institute of Sanitary Engineers on October 18th last.

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Electrical Notes.

Relative Costs of Gas and Electricity for Lighting a Workhouse.—At last week's meeting of the Lanchester Board of Guardians the Building Committee presented a comparative statement compiled by the architects (Messrs. Newcombe & Sons, Newcastle) of the cost of lighting the workhouse, cottage homes and other buildings with gas and electricity. The cost of gas was estimated to be £500 a year and of electricity £173. The cost of the electric installation was put down at £1,725, while the necessary gas-piping, fittings, &c., would cost £350. The report was referred to the committee for further consideration.

Tests with Osmium Lamps.—Considerable experiment has been made in recent years in respect to new filaments for electric glow lamps, and among the rare earths tested osmium has been found to be very successful. It is therefore interesting to note some experiments carried out recently at the Vienna Technological Institute on the average life and power-consumption of lamps with these filaments. Six lamps of 35 volts and 16-c.p. and six lamps of 35 volts and 25-c.p. were tested. They were connected three and three in series, and the groups thus formed were placed on an alternating current circuit at 105 volts. The horizontal luminous intensity and the consumption were measured every 100 hours until the lamps were destroyed. The results obtained were as follows:—A lamp of 16-c.p. gave at first 15·1-c.p., with a consumption of 1·68 watts per candle-power. After 400 hours the luminous intensity increased to 17·3-c.p., and at the end of 2,100 hours fell again to 15·6-c.p. The consumption went down to 1·46 watts per candle-power, and then went up to 1·58 watts. Another lamp of 16-c.p. gave at first 15·2-c.p., then 17·5 after 400 hours, and 16 at the end of 2,200 hours. The average life of the lamps

was 2,200 hours, the limiting values being 1,793 and 3,036 hours. Among the lamps tested three alone presented a diminution in light of 10 per cent.—one after 1,750 hours, the other after 940 hours, and the third after 820 hours. In taking as a basis the lamp which diminishes 10 per cent. in luminous intensity, the average life is found to be 1,985 hours and the average power consumption 1·60 watts per candle-power for a lamp of 16-c.p. and 1·80 watts for a lamp of 25-c.p. The candle-power is given in terms of the Hefner candle, so that the power consumptions must be increased by 13 per cent. to correspond with British standard candles.

The L.C.C. Proposal to Supply Electricity in Bulk.—The newspapers have announced the fact that the London County Council proposes to bring forward a Bill to enable it to supply current in bulk—thus adding one more to its many undertakings. Our contemporary the "Electrical Review" observes that "some of the borough councils are also combining to promote a Bill of their very own for the same purpose; and of course the Administrative Co.'s Bill will come forward again. We may look forward, therefore, to a delightful 'three-cornered duel,' in which the L.C.C. and the company will fight the borough councils; the company and the borough councils will fight the L.C.C.; and the borough councils with the L.C.C. will fight the company. Could anything be more ludicrous—or pitiable? Truly municipalization in London has reached the extreme limit of absurdity and futility. . . . We prophesy a speedy triumph for the company."

A Lecture on Arc Lighting was given on October 17th by Mr. Frank Bailey, M.I.C.E., at the Electrical Exhibition at Olympia. Reference was first made to the discovery of the electric arc a hundred years ago by Sir Humphry Davy, after which various histori-

cal lamps were mentioned, the Rapiëff lamp (1877) being cited as containing many of the leading features of the lamp of to-day. Flame lamps were discussed. Nearly fifty years ago Harrison used a combination of carbon and metallic salts, and twenty years later (in 1879) Hamel described hollow cylindrical carbons, which appear to have been the forerunner of the modern cored carbons. The lecturer said that multi-coloured carbons could now be made so as to indicate the time of night, white being suggested as a convenient colour up to 8 p.m., yellow until midnight, and red for an hour afterwards. Mr. Bailey then proceeded to institute comparisons between lighting by gas and electricity, to the benefit of the latter.

Coming Events.

Monday, November 13.

SURVEYORS' INSTITUTION.—General Meeting at 8 p.m.

Tuesday, November 14.

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. B. Pendleton on "Two Great Cistercian Abbeys of Yorkshire," at 6.30 p.m.

Wednesday, November 15.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Excursion to Dawdon Colliery.

Thursday, November 16.

CARPENTERS' COMPANY.—Mr. James Bartlett on "Setting-out Work for Acts of Parliament and By-laws," Carpenters' Hall, London Wall, at 7.30 p.m.
SOCIETY OF ARCHITECTS.—First Ordinary General Meeting at 8 p.m.

Friday, November 17.

INSTITUTION OF MECHANICAL ENGINEERS.—Meeting at 8 p.m.
BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. R. Catterson-Smith on "Ornamental Design and how it should be taught," at 6.45 p.m.
ARCHITECTURAL ASSOCIATION.—Mr. J. A. Gotch on "Old Manor Houses," at 7.30 p.m.

Saturday, November 18.

JUNIOR INSTITUTION OF ENGINEERS.—Visit to Messrs. Barclay, Perkins & Co.'s Anchor brewery, Park Street, Southwark Bridge, at 2.30 p.m.

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DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :			
Nov. 9	Montrose—Post-office	H.M. Office of Works	W. T. Oldrieve, Architect, H.M. Office of Works, Edinburgh.
" 9	Sutton—Post-office	H.M. Office of Works	H. M. Office of Works, Storey's Gate, London, S.W.
" 9	Llanrhaidr-yn-Mochnant—Alterations to School	Education Committee	W. D. Wiles, Architect, 15 Well Street, Ruthin.
" 10	Whitehaven—Rebuilding House	J. W. Williamson	53 Church Street, Whitehaven.
" 11	Pontymoill—Alterations to Offices	Urban District Council	D. J. Lougher, Pontypool.
" 11	Chesterton—Hospital Block	Rural District Council	F. T. Mullett, Architect, Downing Street, Cambridge.
" 11	Wall Heath—School	Education Committee	Education Offices, Stafford.
" 11	Leith—School Additions	School Board	G. Craig, Architect, 85 Duke Street, Leith.
" 11	Dowlaish—Shop Premises, &c.	Co-operative Society	A. Marks, Architect, Gledeland Street, Merthyr
" 11	Ellon—Additions to Dwelling	Urban District Council	W. Davidson, Architect, Ellon.
" 11	Hindley—School	Education Committee	H. Wade, Architect, 27 Birley Street, Blackpool.
" 11	Bexhill—School	Committee	Education Department, Bexhill, Sussex.
" 11	Twickenham—Free Library	Council	H. Jason Saunders, Clerk, Town Hall, Twickenham.
" 13	Leeds—Works	Electricity Committee	City Engineer's Office, Municipal Buildings, Leeds.
" 13	Prestwich—Transformer Station	Municipality	Borough Engineer, Town Hall, Salford.
" 13	Antwerp—Theatre	Asylum Committee	Hotel de Ville, Antwerp.
" 14	Shrewsbury—Hospital	County Council	A. T. Davis, M.I.C.E., Shire Hall, Shrewsbury.
" 14	Tralee—Hall	Education Committee	Wrenn, Architect, 189 Great Brunswick Street, Dublin.
" 14	Preston-next-Wingham—School	Town Council	G. F. Carter, Borough Engineer, Town Hall, Croydon.
" 15	Stroud Green Well—Foundations, &c.	Managers	A. Swash, M.S.A., Midland Bank Chambers, Newport.
" 15	London, S.W.—Wall	Metropolitan Asylums Board	Metropolitan Asylum Board Offices, Embankment, London.
" 15	Waltham Abbey—Stream Covering, &c.	Urban District Council	W. Turner Streather, Surveyor, Town Hall, Waltham Abbey.
" 16	Falkirk—Post-office Extension	H.M. Office of Works	W. T. Oldrieve, Architect, H.M. Office of Works, Edinburgh.
" 17	Canterbury—Post-office	H.M. Office of Works	Secretary, H.M. Office of Works, Storey's Gate, London, S.W.
" 17	St. Albans—Sorting-office	H.M. Office of Works	Postmaster, St. Albans.
" 17	Grays—Alterations and Additions to School	Governors	T. A. Capron, Clerk, 2 Orsett Road, Grays.
" 21	Gloucester—School	Education Committee	J. Fletcher Trew, Architect, County Chambers, Station Rd., Gloucester.
" 21	King's Lynn—Alterations at Workhouse	Guardians	Jarvis & Son, Architects, Lynn.
" 21	Swindon—County Court	H.M. Office of Works	Registrar, County Court, Swindon.
" 23	Sheffield—New Roofing, &c.	Tramways Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
" 24	East Preston—Infirmary, &c.	Guardians	Guardians Office, East Preston.
" 27	Salford—Offices, &c.	Tramways Committee	General Manager, Tramways Department, Salford.
" 27	Bromley—Municipal Buildings	Town Council	R. F. Atkinson, Architect, 8 Sackville Street, W.
" 30	Uffington—Alterations to School	Managers	G. Cosser, Post Office, Uffington.
" 30	Bournemouth—Schools	Education Committee	Borough Engineer, Bournemouth.
No date	Grassington—Houses	Septimus Wray	J. W. Broughton, Architect, 19 High Street, Skipton.
"	Pontefract—Farmhouse, &c.		Garside & Pennington, Architects, Pontefract.
ENGINEERING :			
Nov. 9	Stockport—Lathes, &c.	Gas and Electricity Committee	S. Meunier, Engineer, Gasworks, Stockport.
" 9	Havana—Pier	Metropolitan Water Board	Cuban Consulate, London.
" 13	Honor Oak—Reservoirs, &c.	Education Committee	District Engineer, Southwark Bridge Road, S.E.
" 13	Oldbury—Heating Apparatus	Gas Committee	A. Long, Architect, 21 New Street, West Bromwich.
" 13	Coventry—Purifiers	Guardians	F. W. Stevenson, Engineer, Gasworks, Coventry.
" 14	Great Yarmouth—Boilers, &c.	County Council	W. J. Carpenter, Engineer, South Denes Road, Road Great Yarmouth.
" 14	London, S.W.—Coal Trucks	Middlesex County Council	County Hall, Spring Gardens, S.W.
" 16	London, W.—Bridge	Royal Infirmary	H. T. Wakelan, Engineer, Middlesex Guildhall, Westminster, S.W.
" 18	Bradford—Heating	Rural District Council	F. Holland, Engineer, 11 Parkinson's Chambers, Hustlergate, Bradford.
" 21	Winchcombe—Water-supply Works	Urban District Council	Willcox & Raikes, Engineers, 63 Temple Row, Birmingham.
" 24	London, N.—Pumping Machinery		Engineer, Council Offices, Finchley, N.
1906.	Auckland—Wharf, &c.	Harbour Board	W. & A. McArthur, 150 Leadenhall Street, London, E.C.
May 1	Talcahuano, Chili—Dock		Direccion de Material, Valparaiso.
IRON AND STEEL :			
Nov. 9	Stockport—Hurdles and Gates	General Purposes Committee	J. Atkinson, Borough Surveyor, Stockport.
" 9	Dundee—Pipes	Water Commissioners	G. Baxter, Engineer, 93 Commercial Street, Dundee.
" 15	Bury—Pipes	Water Board	J. Cartwright, Engineer, Peel Chambers, Market Place, Bury, Lancs.
" 18	London, E.C.—Wrought Iron and Steel, &c.	Thames Conservancy	Thames Conservancy Offices, Victoria Embankment, London.
" 20	Acton, W.—Castings for Pavement Covers, &c.	Urban District Council	W. Hodson, Clerk, Gothic Villa, Mill Hill Grove, Acton, W.
PAINTING AND PLUMBING :			
Nov. 9	London, S.E.—Decorative Repairs	Southwark Guardians	G. D. Stevenson, Architect, 13 and 14 King Street, Cheapside, E.C.
" 13	Leeds—Painting, &c.	City Council	City Engineer's Office, Municipal Buildings, Leeds.
ROADS AND CARTAGE :			
Nov. 9	Leeds—Paving, &c.	Highways Committee	City Engineer's Office, Municipal Buildings, Leeds.
" 9	Cannock—Widening, &c.	Rural District Council	H. M. Whitehead, Engineer and Surveyor, Penkridge, Staffs.
" 9	Penygraig—Road Improvement	Urban District Council	Public Offices, Pentre.
" 10	London, S.E.—Artificial Stone	Urban District Council	H. W. Longdon, Surveyor, Town Hall, Anerley Road, Anerley.
" 13	Mountain Ash—Street Works	Urban District Council	W. G. Thomas, Surveyor, Town Hall, Mountain Ash.
" 13	London, N.—Road Works	Town Council	E. J. Lovegrove, Borough Surveyor, Municipal Offices, 99 Southwood Lane, Highgate.
" 13	London, S.E.—Kerbing, &c.	Borough Council	Surveyor's Department, Town Hall, Catford.
" 15	Kingston-upon-Thames.—Road Works	Corporation	Borough Surveyor, Municipal Offices, Kingston-upon-Thames.
" 15	Shildon—Road Works	Urban District Council	M. Turnbull, Surveyor, Shildon, Darham.
" 20	Gower—Road Widening, &c.	Rural District Council	T. Gordon Bowen, Surveyor, Penygraig, Penclawdd, R.S.O.
SANITARY :			
Nov. 9	Murton Colliery—Sewage-disposal Works	Rural District Council	C. Rule, Surveyor, Haswell, via Sunderland.
" 11	Chesham—Sewer	Urban District Council	P. C. Dormer, Surveyor, Council Offices, Chesham.
" 11	Doncaster—Scavenging	Rural District Council	F. E. Nicholson, Clerk, Union Offices, Doncaster.
" 15	Watford—Sewage Irrigation Works	Metropolitan Asylums Board	Metropolitan Asylums Board Offices, Embankment, E.C.
" 15	Swanley—Surface-Water Drainage	Metropolitan Asylums Board	Metropolitan Asylums Board Offices, Embankment, E.C.
" 21	Aberdeen—Drainage Works	Town Council	W. Dyack, Surveyor, 41½ Union Street, Aberdeen.
" 21	Winchcombe—Sewerage Works	Rural District Council	Willcox & Raikes, Engineers, 63, Temple Row, Birmingham.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
1906.				
Jan. 15	Hackney—Library	50, 30 and 20 guineas	£1 is.	W. A. Williams, Town Clerk, Town Hall, Hackney.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT (21) seeks situation. London office. Good draughtsman. Detail and small scale drawings. 4 years' general experience. Good references. Moderate salary.—R. F. D., 4, Buckland House, Oford Rd., N. 1451

ARCHITECT'S ASSISTANT (24) DIS-ENGAGED. Working drawings, all details, surveying, assist with quantities; experienced; excellent references.—Box 1441, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT (25) DIS-ENGAGED. Nine years' experience. Good draughtsman, designs, working drawings, details, etc. London or country.—W. A. N., 46, St. Augustine's Road, Camden Square, N.W. 1442

ARCHITECT'S ASSISTANT (25) Disengaged. Ten years' experience; working drawings, details, surveying, supervision, assist with quantities; excellent references.—A. C., 37, Hardman Road, Kingston-on-Thames.

ARCHITECT'S ASSISTANT (20) desires ENGAGEMENT; working drawings, details, surveying, assist with quantities; experienced; excellent references.—Box 1474, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and QUANTITY SURVEYOR'S ASSISTANT (23) desires engagement; working drawings, abstracting and billing, surveying, &c. Provincial and London experience.—Box 1473, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S ASSISTANT desires engagement. Ten years' practical experience in all branches of the profession.—Apply to S. H., 25, Palace Square, Upper Norwood, S.E. 1481

ARCHITECT'S CHIEF ASSISTANT (30), twelve and a half years' experience, desires ENGAGEMENT in good office. Managership preferred. Thoroughly competent. Five and a half years with noted London architect. Excellent references. Disengaged shortly.—Box 1461, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S COMPETENT JUNIOR seeks engagement, good general experience, excellent reference from well-known architects. Salary 25s.—DONCASTER, 1, Wells Road, Shepherd's Bush, W. 1421

ARCHITECT (26) with several years' provincial and London experience desires ENGAGEMENT as Assistant. Good all-round man.—G., "The Poplars," Collyweston, Stamford. 1440

ARCHITECTS.—Well-educated Youth (18) seeks JUNIOR POSITION. Good draughtsman and tracer. Moderate salary.—Address, ADVERTISEMENT, 91, Tollington Park, N. 1431

ARCHITECT'S JUNIOR ASSISTANT desires engagement in or near London. Accurate draughtsman and tracer; excellent knowledge of construction and quantities. Good references.—A. G. O., 117, Brighton Road, Croydon. 1423

ARCHITECT'S JUNIOR ASSISTANT seeks ENGAGEMENT; whole or part time; 5 years' experience. Good draughtsman, tracer, &c.—A. S., 119, Finsbury Pavement, E.C. 1482

ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT requires situation in Architect or Builder's office. Four years' experience; good draughtsman, tracer, &c. Moderate salary.—A. C. W., "Owlscot," Purley, Surrey. 1425

BUILDERS' CLERK. Re-appointment; 25 years' experience in the West-end trade, and possessing general knowledge of same. Trustworthy; first-class references. Salary moderate.—G. B., 55, Lavender Sweep, Lavender Hill, S.W. 1443

CARPENTER, JOINER, STAIRHAND; PLASTERER, clean workman; piece or day; abstainers; town or country.—A. E., 84, Cambourne Road, Southfield, Wandsworth. 1432

CLERK OF WORKS desires EMPLOYMENT. Many years Government Service. Any district, but Essex preferred; good references.—W. LUMSDEN, "Woodside," Southminster. 1459

CLERK (24) seeks situation in Builders or Estate Agent's Office. Eight years' general office experience; moderate salary; good references.—Wood, 4, Market Place, North Ormesby, Middlesbrough. 1477

GENERAL FOREMAN seeks ENGAGEMENT; long and varied experience; energetic and reliable.—Box 1479, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

GENERAL FOREMAN BRICKLAYER at liberty. Town or country. Thoroughly competent. Five years last (London) employer, to whom references permitted. Good disciplinarian, timekeeper, &c.—G. L., 58, Rosslyn Crescent, Wealdstone. 1426

GENERAL or WORKING FOREMAN (Carpenter); town or country; practical experience all branches, building, alterations, or good jobbing; wages moderate.—A. WEBBER, 29, Pollock Road, Walworth, S.E. 1456

PAPERHANGER, good, wants piecework. Distance no object.—C. MARKHAM, 11, Great Sutton Street, Clerkenwell, E.C.

PLUMBER and ELECTRICIAN (practical workman) wants Situation. Good references. Age 28. Any distance, or abroad. Wages moderate for comfortable shop.—PLUMBER, 1, Queen's Road, Penkhull, Stoke-on-Trent. 1439

PLUMBER, reliable, wants JOB. Well up in sanitary work and lead-laying; wages moderate, or would take piece-work labour and solder only; good reference; age 31.—A. SMITH, 7, Ludwick Road, New Cross, S.E. 1457

QUANTITIES.—Surveyor, with London office, prepares Quantities, Estimates, Variations, &c. Terms by arrangement.—Box 1468, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

SHOP FOREMAN OF JOINERS seeks RE-ENGAGEMENT. Thoroughly capable and accurate setter out. Total abstainer. Refs.—Box 1449, BUILDERS' JOURNAL Office, 6, Great New Street, E.C.

TO LONDON ARCHITECTS.—Advertiser (23) desires change into London office (temporary or permanent); eight years' varied provincial experience in several offices. Prize winner for measured drawings, construction and quantities; 25s. to commence.—Box 1448, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

YOUNG MAN requires ENGAGEMENT as BUILDER'S ASSISTANT, having an excellent all-round home and colonial experience. Abstainer; best references.—Apply, Rookfield, Muswell Hill, London, N. 1413

Appointments Vacant.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

BITUMEN DAMP COURSE. AGENTS WANTED throughout Great Britain for the Sale of Genuine Trinidad Bitumen Damp Course. Superior in quality and low in price. Liberal commission.—Apply W. W. BAMFORD, Ltd., Deep Water Pier, Northfleet.

FIGURE GLASS PAINTER WANTED.—Young man preferred, state wages expected; experience.—Apply by letter EMPLOYERS' ASSOCIATION, 18, Victoria Street, Toronto, Canada.

REPRESENTATIVE WANTED, who thoroughly understands the best class of Metal work and Electric Light Fittings. Must have good connection with the leading Architects and Electrical houses. This is an exceptional opportunity for a suitable man.—Apply, stating age, district, experience, and terms, to J. W. SINGER & SONS, Frome.

SAWING and PLANING MILL.—Wanted an experienced man to control and supervise wood-working mill with the object of increasing the output.—Apply Box 1666, c/o Dixon's, 195, Oxford Street, London, W.

Drawings, Tracings &c.

AN ARCHITECT has time to ASSIST others with working drawings, details, tracings, and perspectives at own office or otherwise. Good general experience. Special terms for competitions.—Apply H. L. FEDDEN, 11, Hart Street, Bloomsbury. 1411

ARCHITECT, fourteen years' good experience, renders competent assistance in design, drawings, perspectives, or competition work at own office.—Box 1467, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

DRAIN PLANS PREPARED.—JOHN LAWRENCE, Jun., M.R.S.I., A.I.S.E., 112, Shirland Road, W.

HOSPITALS and SCHOOLS.—EXPERT ASSISTANCE offered on designs. Placed 1st and 2nd in Competitions for Buildings to cost over £223,000.—G. B., "Woodlands," Ryde, I.W. 1460

PLANS and SPECIFICATIONS prepared for flats or residences, and property measured and planned. Terms can be arranged to suit clients.—C. M. P., 53, Coldharbour Lane, Camberwell, S.E. 1461

QUANTITY SURVEYOR.—Quantities prepared, variations measured, &c., by experienced quantity surveyor. Terms by arrangement.—Box 1315, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

SCHOOLS, HOSPITALS and LIBRARIES.—Assistance given by Scotch Expert. Speculative terms for competitions.—Box 1438, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, London, E.C.

YOUNG ARCHITECT and SURVEYOR desires to assist during his spare time in the preparation of Contract or Competition Drawings. Surveys made. Ten years London experience.—E. C., 100, Archway Road, N. 1437

Businesses Wanted & For Sale

BUILDERS' and DECORATORS' BUSINESS for DISPOSAL, about 30 miles from London, in small town. First-class Premises with House adjoining.—Apply Box 1452, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

Partnerships.

ARCHITECT wishes to meet another to share office, with view to future partnership. Good designer and with connection essential.—Apply Box 1480, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

Miscellaneous.

ALFRED S. TUCKER'S ALABASTER AND MARBLE WORKS, 143½, Euston Road, N.W. Telephone: 2955 Central.

CAPITAL REQUIRED for the development of well-known patent system of building. A business is already established.—Apply Box 1471, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ESTIMATING FOR DILAPIDATIONS. A few practical lessons (afternoon) required.—Address "London," Box 1450, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

FOR SALE, cheap. A large quantity of BLOCKS and SAWN DERBYSHIRE STONE from Matlock, Darley Dale, and Stanton Quarries. Also BLUE and BROWN YORK.—Apply, J. HODSON & SON, Ltd., Stone Merchants, Nottingham.

FOR SALE. Fire-proof Impregnable Safe Door, 6 ft. by 2 ft. 6 in. by 4½ in. thick. Four bolts and frame complete. By Whitfield, Birmingham. As good as new.—Apply to RAWLANCE & SQUARBY Digby Estate Office, Sherborne.

"GRANDMASTER."—Grove Flanged Draught Chimney Pot. The Noiseless and most efficient Smoke Conductor.—PARKINSON, Greenhill Road, Armley, Leeds; STIDDER & Co., Agent for London. Chief Offices and Showrooms: 16, Percy Street, Tottenham Court Road, W.

MARBLE AND GRANITE WORK. Speciality, Shopfittings, Steps, and Monuments.—KELLY & Co., Masons, Mill Hill, N.W., also Kilburn N.W., and Harpenden, &c. Telephone, 1159 Hampstead.

OFFERS WANTED for last 250 numbers BUILDERS' JOURNAL.—Box L.M., BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

POLING BOARDS, selected lengths and thicknesses (best quality and full measure). Also Scaffold Boards, Putlogs, Scantlings, Deals, Battens, and Boards. Lowest wharf prices. C. H. GLOVER & Co., Ltd., Importers, Hatcham Saw Mills, Old Kent Road, S.E.

TO CONTRACTORS and MANUFACTURING WORKS. Portable Electric Winches and Hoists with Motors attached, and Electrical Systems of transporting goods.—Apply to TILSTONE DUDGEON, Ewell, Surrey.

VENTILATING and HEATING EXPERTS.—ACME VENTILATING and HEATING CO., Tarleton Street, Liverpool.

WROUGHT STONEMASONRY supplied to Architects and Builders in either Ketton, Edith-weston, Weldon, or Stamford stones. Estimates free.—BELTON and GODDARD, Little Casterton Rd., Stamford.

WORKING or COMPETITION DRAWINGS, PERSPECTIVES, TRACINGS, PHOTO-COPIES, MODELS OF BUILDINGS, WORKS, ETC., LITHO-PRINTING.

THE LONDON DRAWING & TRACING OFFICE, (Estd. 1883,) 98, Gray's Inn Road, W.C. (Adjoining Holborn Town Hall.)

Telephone, No. 1011 HOLBORN. Manager—**JOHN B. THORP.** Telegrams: "DIVIDITORE," LONDON

Educational.

R. I. B. A., SOCIETY OF ARCHITECTS AND CIVIL SERVICE TECHNICAL EXAMINATIONS, preparation by correspondence or residence. 29 first places.—G. A. T. MIDDLETON, 19, Craven Street, Strand.

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating.—For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

R. I. B. A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for Syllabus to Mr. A. G. BOND, B.A., Oxon., A.R.I.B.A., 115, Gower Street London, W.C. (late Howgate and Bond).

STRUCTURAL STEELWORK

Can you Design your own Steelwork? Do you know how to properly proportion your columns, stanchions, and girders? We guarantee to teach you how to do this in a few lessons by our System of Correspondence Tuition in Architectural Steelwork.—Apply to us for free Booklet J (4th edition), MIDLAND ENGINEERING BUREAU, STRAND, DERBY.

PRACTICAL DESIGNING OF STEEL CONSTRUCTIONAL WORK taught by Correspondence, individually or in classes. Elementary and advanced courses arranged for Architects, Engineers, &c. Write for Prospectus B, EMBANKMENT ENGINEERING INSTITUTE, 156, Temple Chambers, Temple Avenue, E.C.

THE QUANTITY SURVEYORS' ASSOCIATION.

(INCORPORATED.)

A PRELIMINARY EXAMINATION for the admission of Students of the above Association, and a DIRECT FINAL EXAMINATION qualifying for Membership, will be held in APRIL 1906.

Applicants must send in their names for approval by the Council on Forms which (together with the Syllabus) may be obtained from the undersigned, on or before the 30th day of NOVEMBER, 1905.

F. B. HOLLIS, Hon. Sec.,
October, 1905. 17, Bedford Row, London, W.C.

Property & Land Sales.

To Contractors, Motor-car Engineers, and others.

MESSRS. LINNETT & LANE will SELL by AUCTION, at the MART, E.C., on FRIDAY, NOVEMBER 10th, 1905, at TWO o'clock, the following FREEHOLD and LEASEHOLD PROPERTIES:—

KILBURN.—Extensive and valuable BLOCK of FREEHOLD STABLING PREMISES, situated in Pembroke Mews, comprising seventy-six stalls, spacious loft, harness-room, and paved yard approached by double entrance gates, the whole property having an area of about 6,550 super feet, and also the adjoining long LEASEHOLD STABLING PREMISES, comprising four-stall stable with loft, double gateway entrance, and paved yard (the whole is let to the Victoria Omnibus Company at £330 per annum, the tenants paying rates and taxes); and also the substantial ally-built DWELLING-HOUSE, No. 69, Granville Road, adjoining the above property, and let at £33 per annum the tenant paying rates and taxes. Held by lease, together with the last-mentioned property. Unexpired term about fifty-seven years, ground rent £8 10s. per annum.

Particulars of the Solicitors, Messrs. THOMAS FRAME & SON, 37 and 39, Essex Street, Strand, W.C., and of the AUCTIONEERS, 62, 64 and 66, Station Road, Willesden Junction. Telephone No. 41, Harlesden.

To Builders and Land Speculators. — FREEHOLD MANSION, with upwards of an acre of ground. Free from restrictions.

SYDENHAM.—No. 42, NEWLANDS PARK — Large FREEHOLD MANSION, with coach-house and stabling, greenhouses, pit lights, gardeners' sheds, &c. With a frontage of about 420 ft. to existing roads, and thoroughly ripe for immediate development as a building estate and the creation of ground rents. The mansion is adaptable for conversion into good-class flats or eligible for a public institution. Adjoining recreation grounds and close to two stations.

MR. GEO. PRATT, F.A.I., will SELL the above by AUCTION, at the MART, Tokenhouse Yard, London, E.C., on WEDNESDAY, NOVEMBER 8th, at TWO o'clock.

Particulars, plans, and conditions of Sale of the Solicitors, Messrs. POCOCK & GODDARD, 3, South Square, Gray's Inn, W.C., and of the AUCTIONEER, Railway Approach, Sydenham, S.E.

Contracts Open.

BOROUGH of BROMLEY.

MUNICIPAL BUILDINGS, &c.
The Council of the Borough of Bromley is prepared to receive TENDERS for the ERECTION of MUNICIPAL BUILDINGS, &c., in Tweedy Road, Bromley, in accordance with drawings and specification prepared by Mr. R. FRANK ATKINSON, F.R.I.B.A., of 8, Sackville Street, W., which, together with draft Contract and conditions, may be seen at his Office, or at the Office of the Quantity Surveyor, Mr. SAMUEL A. STANGER, F.S.I., 21, Finsbury Pavement, E.C.

Bills of quantities and form of Tender will be furnished on application being made to me not later than the 7th of November next, accompanied by a £5 Bank of England Note, which will be returned on the receipt of a bona fide Tender.

Tenders, endorsed "Tender for Municipal Buildings," to be delivered to me as under not later than MONDAY, the 27th day of NOVEMBER 1905.

The Council does not bind itself to accept the lowest or any Tender.

FRED H. NORMAN,
Municipal Offices, Town Clerk.
Bromley, Kent,
25th October, 1905.

COUNTY BOROUGH OF CROYDON. STROUD GREEN WELL—CONTRACT No. 2. TO EXCAVATORS AND BUILDERS.

Notice is hereby given, that the Council are prepared to receive TENDERS for the EXCAVATING, CONCRETE, and BRICKWORK necessary in the Foundations of the Engine Room at the Stroud Green Well.

Plans can be seen, and Specifications, Bills of Quantities, and Form of Tender obtained at the Office of Mr. GEORGE F. CARTER, A.M.Inst.C.E., Borough Engineer, Town Hall, Croydon, upon payment of a deposit of £1 1s., which will be returned upon receipt of a bona fide Tender.

Tenders to be sent to me by ELEVEN o'clock in the Forenoon on TUESDAY, the 14th NOVEMBER, 1905, endorsed "Stroud Green Well—Contract No. 2."

Tenders will only be received subject to the terms of the Draft Contract, which has been deposited at the Office of the Borough Engineer aforesaid, and may be inspected during office hours.

The Council will not be bound to accept the lowest or any Tender.

F. C. LLOYD, Town Clerk.
Town Hall, Croydon,
2nd Nov., 1905.

GLoucester EDUCATION COMMITTEE.

TO BUILDERS AND CONTRACTORS.

Builders desirous of TENDERING for the ERECTION of COUNCIL SCHOOLS in Derby Road, Gloucester, are requested to send their names to the Architect, Mr. J. Fletcher Trew, M.S.A., County Chambers, Station Road, Gloucester, not later than the 1st NOVEMBER next, between the hours of Ten and Five, at whose office the plans and specifications may be seen.

Bills of quantities may be obtained from Messrs. Vale & Kingsford, George Street, Gloucester, on deposit of £5 note, which will be returned on receipt of a bona fide Tender with the return of all papers supplied.

Sealed Tenders are to be sent in to the undersigned not later than NOON on TUESDAY, NOVEMBER 8th next, endorsed "Tender for Derby Road Council Schools, Gloucester."

The Committee do not bind themselves to accept the lowest or any Tender.

P. BARRETT COOKE, Secretary,
5, Berkeley Street, City of Gloucester Education
Gloucester. Committee.

EMPLOYMENT REGISTER.

Too late for Classification.

- 1472.—ARCHITECT'S ASSISTANT (24); working drawings, details, surveying, quantities; ex. refs., good exp.
- 1473.—ARCHITECT AND QUANTITY SURVEYOR'S ASSISTANT (23); working drawings, abstracting, and billing, surveying, &c.; London and Provincial exp.
- 1474.—ARCHITECT'S ASSISTANT (20); working drawings, details, surveying, assist with quantities; exp., excellent refs.
- 1477.—CLERK (24); Builder's or Estate Agent's office; 8 yrs. exp.; mod. s.; good refs.
- 1479.—GENERAL FOREMAN; long and varied exp.; energetic and reliable.
- 1481.—ARCHITECT AND SURVEYOR'S ASSISTANT; 10 yrs. practical exp. in all branches of the profession.
- 1482.—ARCHITECT'S JUNIOR ASSISTANT; 5 yrs. exp. good draughtsman, tracer, whole or part time.

See p. xx for the Employment Register.

OUR METHOD

OF ADVERTISING

A "WANT"

not only brings results, but it saves you expense.

We give three insertions of an advertisement for the price of two, and in addition we tabulate the particulars you send under a special heading in the Employment Register, and keep it there for *six weeks* free of any extra charge.

Thus for 3s. a four line advertisement appears in two places in our paper, and your "want" is advertised for six weeks.

We know this is generous treatment, but we think when a man is out of a situation it is a time when a little generosity is appreciated. The letters we have already received from those who have taken advantage of this scheme point clearly to the truth of this, and we are glad to know that the Employment Register has already helped many to find good positions.

The only condition we make is that immediately an appointment is obtained we are advised in order that we may take the number and name off the Register, thus saving waste of space.

All advertisements for next week must reach this office not later than 5 o'clock on Monday, the 13th inst.

The Employment Register in this number appears on page xx.

The Three Builders' Journal Insurance Schemes are—

- (1) A Free Accident Insurance of £500.
- (2) An Accident Insurance of £500.

And also

£250 for Permanent Total Disablement.
£2 10s. per week for Temporary Total Disablement.

Premium, 1/-

(For the conditions under which policies Nos. 1 and 2 are issued readers should refer to our pamphlet, sent on application.)

- (3) An Accident Insurance of £1,000,
£500 for Permanent Total Disablement,
£6 per week for Temporary Total Disablement,
with special advantages.

Write for our Insurance Pamphlet to—

The MANAGER,
Technical Journals, Ltd.,
Great New Street, E.C.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Current Market Prices

FORAGE.			
	£	s.	d.
Beans	per qt.	1	12 0
Clover, best ...	per load	3	10 0
Hay, good	do.	3	5 0
Sainfoin mixture ...	do.	3	7 0
Straw	do.	1	10 0

OILS AND PAINTS.			
	£	s.	d.
Castor Oil, French ...	per cwt.	1	6 3
Colza Oil, English ...	do.	1	4 6
Copperas	per ton	2	0 0
Lard Oil	per cwt.	2	15 0
Lead, white, ground, carbonated ...	per ton	16	0 0
Do. red	do.	15	0 0
Linseed Oil, barrels ...	per cwt.	0	17 9
Petroleum, American ...	per gal.	0	0 7½
Do. Russian	do.	0	0 6½
Pitch	per barrel	0	8 0
Shellac, orange	per cwt.	8	16 0
Soda, crystals	per ton	3	2 6
Tallow, Town	per cwt.	1	6 3
Tar, Stockholm	per barrel	1	5 0
Turpentine	per cwt.	2	11 3

METALS.			
	£	s.	d.
Copper, sheet, strong ...	per ton	86	0 0
Iron, Staffs., bar	do.	6	15 0
Do. Galvanized Corrugated sheet ...	do.	11	15 0
Lead, pig, Soft Foreign ...	do.	15	2 6
Do. do. English common brands ...	do.	15	7 6
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	17	0 0
Do. pipe	do.	17	10 0
Nails, cut clasp, 3in. to 6in. ...	do.	9	5 0
Do. floor brads	do.	9	0 0
Steel, Staffs., Girders and Angles ...	do.	6	5 0
Do. do. Mild bars ...	do.	6	5 0
Tin, Foreign	do.	149	10 0
Do. English ingots ...	do.	152	0 0
Zinc, sheets, Silesian ...	do.	31	7 6
Do. do. Vieille Montaigne ...	do.	31	10 0
Do. Spelter	do.	28	5 0

TIMBER.			
Soft Woods.			
	£	s.	d.
Fir, Dantzic and Memel ...	per load	2	15 0
Pine, Quebec, Yellow ...	do.	4	2 6
Do. Pitch, American ...	do.	3	1 0
Laths, log, Dantzic ...	per cu. fath.	4	0 0
Deals, Transund, Yellow Unsorted, 6x6 ...	per std.	9	5 0
Do. Quebec, Yellow Pine, 1st, 3x14 & 17 ...	do.	21	5 0
Do. do. do. 1st, 3x12 & 13 ...	do.	17	15 0
Do. do. do. do. 1st, 3x11 ...	do.	18	10 0
Do. do. Spruce, Unsorted, 2½x7 ...	do.	8	0 0
Do. Narva, Yellow, 1st and 2nd, 3x11 ...	do.	8	5 0
Do. Batiscan, Spruce, 1st, 3x9 ...	do.	12	10 0
Do. Archangel, Yellow, 4th, 3x7 ...	do.	8	5 0
Do. Lovisa, Yellow, 1st, 3x7 ...	do.	7	15 0
Do. St. Petersburg, White, 3rd, 2½x7 ...	do.	8	0 0
Battens, all kinds ...	do.	6	15 0
Flooring Boards in prepared, 1st ...	per square	0	10 0
Do. 2nd	do.	0	9 0
Do. 3rd, &c.	do.	0	8 9

HARD WOODS.			
	£	s.	d.
Ash, Quebec	per load	3	15 0
Birch, New Brunswick ...	do.	2	5 0
Do. Quebec do.	do.	2	10 0
Box, Turkey	per ton	7	0 0
Cedar, Cuba	per ft. sup.	0	0 4½
Do. Honduras	do.	0	0 6½
Do. Tobasco	do.	0	0 5
Elm, Quebec	per load	4	0 0
Jarrah, plank	per ft. cu.	0	2 6
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0	0 4½
Do. Tobasco	do.	0	0 3½
Do. Cuba	do.	0	0 4½
Do. African	do.	0	0 2½
Oak, Wainscot	per log.	3	10 0
Teak, Indian, logs	per load	9	5 0
Do. do. planks	do.	12	15 0
Whitewood, American, logs	per ft. cu.	0	1 3
Do. do. planks and boards	do.	0	1 3

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending November 3rd twenty-eight failures in the building and timber trades in England and Wales were gazetted.

J. A. McKAY, plumber, Sunderland. R.O. Oct. 24th.
E. CHATWIN, builder, Birmingham. R.O. Oct. 23rd.
JONES & CATHALL, plumbers, Wrexham. Adj. Oct. 23rd.

A. JONES, builder, Dowlais. P.E., Merthyr Tydfil, Town Hall, Nov. 29th, at 3.
H. OSWIN, builder, Walsall. Gross liabilities £1,000; assets £309.

D. THOMAS & SON, builders and contractors, Cardiff. Liabilities £1,176; assets nil.

J. S. DOUGLAS, builder, Northampton. Deficiency £1,085.

TANNER BROTHERS, builders and contractors, Raunds. Deficiency £517.

H. & A. J. BLACKELL, builders, Plymouth. Liabilities £1,865.

A. W. FOX, painter and plumber, Great Yarmouth. Adj. Oct. 28th.

W. ELLIS, junr., surveyor, Clapham Junction. R.O. Oct. 25th.

H. VIDLER & Co., builders, Surbiton. P.E., Wandsworth C.C., Nov. 16th, at 12.

BROWN BROTHERS, builders' merchants, Salisbury. R.O. Oct. 28th.

G. BROCK, builder, Longstock. P.E., Southampton C.C., Nov. 29th, at 12.

C. FIELDING, builder and contractor, Glossop. Adj. Oct. 27th.

C. MITCHINSON, plumber, Bishop Auckland. P.E., Durham C.C., Nov. 14th, at 10.40.

C. LEWERS, builder, Seacombe. First meeting, O.R.'s, Liverpool, Nov. 8th, at 2.30. P.E., Birkenhead C.C., Dec. 13th, at 11.

EVANS & ROBERTS, builders and contractors, Brynaman. First meeting, O.R.'s, Carmarthen, Nov. 8th, at 11. P.E., Carmarthen Guildhall, Nov. 8th, at 12.

MELSHAM LAND, BUILDING AND COAL CO. First meeting, O.R.'s, Bristol, Nov. 8th, at 12.15. P.E., Bath Guildhall, Nov. 30th, at 11.30.

W. SMITH, builder and contractor, Farnborough (late Blackwater and Ilford). P.E., Guildford Town Hall, Dec. 12th, at 1.

W. G. HELLIER, plumber and decorator, Belvedere. First meeting, 115, High Street, Rochester, Nov. 13th, at 11.30. P.E., Rochester C.C., Nov. 13th, at 2.30.

R. AIREY, painter and decorator, Blackburn. P.E., Blackburn C.C., Nov. 8th, at 10.30. First meeting, same, at 11.30.

H. WOOLF, builder and contractor, Whitechapel. First meeting, London Bankruptcy Court, Nov. 10th, at 12. P.E., same, Nov. 28th, at 11.30.

W. C. STEPHENS, builder, Southend-on-Sea. First meeting, 14, Bedford Row, London, W.C., Nov. 10th, at 12. P.E., Shirehall, Chelmsford, Dec. 6th, at 10.

B. THOMPSON, builder, Leytonstone. First meeting, London Bankruptcy Court, Nov. 9th, at 12. P.E., same, Nov. 28th, at 12.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C.

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberdare.—For the erection of sixty-one houses, at per house, for the Gadlys Uchaf Building Club:—

E. Davies, 61, Tudor Terrace, Aberdare	£265 10 0
D. T. Davies, Treconyn, Aberdare	259 10 0
D. Rees, 46, Mill Street, Aberdare	258 0 0
R. Jones, Abertridwr, near Cardiff	255 0 0
L. Davies, Abercynon	245 0 0
W. F. & L. Price, Cardiff	231 0 0
F. W. & J. Jenkins, Merthyr	224 10 0

Briton Ferry (Glamorgan).—For pulling down old buildings and erecting new power boiler-house, for the Cape Copper Co. Mr. J. M. V. Money-Kent, engineer, 17, Sloane Street, London:—

H. Billings	£1,027
W. H. Michael & Co.	1,012

Cardiff.—For the erection of branch libraries at Cathays and Canton, for the Free Library Building Committee:—

G. Hallett—Canton Library	£4,200
W. T. Morgan—Cathays Library	3,898

Coventry.—Accepted for the works required to be executed and material supplied in connection with alterations and additions at the public baths, Priory Street, for the Corporation. Mr. J. E. Swindlehurst, city engineer and surveyor:—

Kelley & Son, Little Heath, Foleshill, Coventry	1,197 5 5
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Eastbourne.—For erection of a fire-station at the side of the Technical Institute, Grove Road, for the Corporation. Mr. Philip A. Robson, architect Palace Chambers, 9, Bridge Street, Westminster, S.W.:—

M. Hookham	£5,423
W. Burgess	5,354

New Companies.

BISHOP'S PARK ESTATE CO., LTD., builders, contractors, &c., Norbury, S.W. Capital: £1,000.

JOSEPH WOOD AND SONS, LTD., to acquire the business of builders and contractors carried on as Joseph Wood & Son at the Butts, Worcester, to adopt an agreement with J. S. Wood and J. Joseland, and to carry on the business of decorators, importers of and dealers in stone, sand, lime, &c. Capital: £20,000.

Norman & Burt	£5,195
J. Wood & Sons	5,190
Martin, Wells & Co.	5,150
J. Garrett & Son	5,084
Strange & Sons	5,077
E. Cornwall & Sons	5,062
J. Martin	5,050
R. Cook & Sons	4,914
F. G. Minter	4,912
Miller & Selmes	4,847
A. J. White	4,834
J. Longley & Co.	4,768
Peerless, Dennis & Co., Langley Road, Eastbourne	4,747
Rowland Brothers	4,659

* Accepted.

Haslemere.—For the erection of proposed house. Mr. F. Cornelius-Wheeler, architect and surveyor, 5, Abchurch Yard, Cannon Street, E.C.:—

J. W. Ele	£1,994
W. Eyre	1,994
Chapman & Lowrie	1,869
J. Longley	1,848
F. Milton	1,794
Haslemere Builders	1,720
W. H. Kent	1,649

Harrow.—For the erection of a new billiard-room at Enscote, for Dr. Woodhouse Braine. Mr. F. Cornelius-Wheeler, architect, 5, Abchurch Yard, Cannon Street, E.C.:—

J. Smith	£306
W. Eyre	285
J. Batchelor	223

Halifax.—Accepted for the various works required in the erection of additions to the Campbell Gas-Engine Co.'s Works. Messrs. Jackson & Fox, architects, 7, Rawson Street, Halifax:—

Mason and joiner.	
J. Charnock & Sons	£2,620 0 0

Iron and steel.

A. Pulman & Son	1,754 9 0
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Patent glazier.

Standard Patent Glazing Co., Dewsbury	284 10 0
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Plumber.

Bolton Brothers	378 0 0
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Slater.

Rushworth & Frith, New Bank	390 0 0
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Painter.

S. Ackroyd	69 9 0
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[Rest of Halifax.]

Hunstanton.—For the erection and completion of a new building for children at the Convalescent Home. Mr. A. Paul MacAllister, architect, 20, St. Andrew's Street, Cambridge:—

F. Giddings, St. Ives	£6,830 0 0
Oak Building Co., Cambridge	6,630 0 0
Read & Wildbur, King's Lynn	6,310 0 0
J. Medwell, King's Lynn	6,253 0 0
F. Newton, Hitchin	5,992 0 0
J. Cranknell, Peterborough	5,948 0 0
J. Youngs & Son, Norwich	5,946 0 0
Tash, Langley & Co., King's Lynn	5,899 10 0
Redding & Sons, Cambridge	5,830 0 0
G. W. Heath, March	5,813 7 0
R. Dye, King's Lynn	5,762 0 0
R. Shanks, Chatteris	5,695 0 0
J. Bridgefoot & Son, Peterborough	5,650 3 6
E. Willmott & Son, Cambridge	5,636 0 0
F. Southgate, Hunstanton	5,537 0 0
P. Anderson, King's Lynn	5,376 5 7
Clark & Sons, Cambridge	5,343 9 9
S. Hipwell & Co., Wisbech, Cambs	5,336 0 0
D. Grays, Peterborough	5,270 0 1
J. Gutteridge, Peterborough	4,977 0 0

* Accepted.

London, E.C.—For the construction of an underground convenience at the junction of City Road and Goswell Road, for the Finsbury Borough Council:—

W. Shurmer & Sons, London, N.E.	£2,295 0 0
G. Jennings, Ltd., London, S.E.	2,285 0 0
Davis & Rennell, London, S.W.	2,270 0 0
Spencer, Santo & Co., London, W.	2,050 0 0
C. Deering & Sons, London, W.	1,955 0 0
G. Wales & Co., London, N.E.	1,920 10 0
Sabey & Son, 3, St. Peter's Street, N.	1,928 0 0

* Accepted. [Surveyor's estimate, £2,278.]

Mountain Ash.—For the erection of twenty-five or more houses at Mountain Ash, for the Cilnhal Building Club. Mr. T. W. Millar, architect, &c., Mountain Ash:—

T. W. Davies, Mountain Ash	£5,475
Jenkins Brothers, Merthyr Tydfil	5,250
Jones Brothers, Treharris	5,200

Davies & Co., Cardiff Road, Mountain Ash

* Accepted.

New Oscott (Birmingham).—For sewerage and drainage works, &c., at the Princess Alice Orphanage, New Oscott. Messrs. Marston & Healey, engineers, Sutton Coldfield & Walsall:—

	Sewerage.	Drainage.
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G. Law, Kidderminster	£436 9 0	£550 6 6
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J. White, junr., Handsworth	409 12 0	568 10 4
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A. Cooper, Smethwick	376 0 6	492 17 6
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Curral, Lewis & Martin, Birmingham	384 0 0	449 0 0
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G. F. Tomlinson, Derby	383 0 0	446 0 0
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H. Holloway, Wolverhampton	337 13 10	467 6 10
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Sunderland & Thorpe, Smethwick	343 12 10	454 6 8
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J. Atkins, Walsall	383 16 9	409 10 9
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E. —, Smethwick	323 4 4	429 7 6
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F. J. Smith, Wednesbury	398 10 0	412 7 0
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* Accepted. [Engineer's estimate, £775.]

Newcastle.—Accepted for the erection of baths and washhouse at the corner of New Bridge Street and Gibson Street, for the Corporation:—

J. & G. Douglass	£16,334 4 10
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(Continued on p. xviii.)

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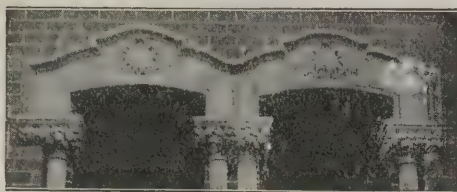
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(See displayed Advt. in issue for November 1, p. ii.)

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17½ x 3 x 2	8 3	7 9	11 5
17½ x 3 x 1½	6 9	6 3	9 0

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TENDERS—cont. from p. xvi.

Canwell Hall (Staffs).—For the conversion of existing gas-house and addition of engine-house, &c., as an electric-light station on the Canwell Hall Estate, for Mr. Philip S. Foster, M.P. Mr. Charles M. C. Armstrong, architect, 5, High Street, Warwick:—
 Maple & Co., London ... £1,398 0 0
 W. J. Whittall & Son, Birmingham 1,242 2 6
 * Accepted with modifications.

London.—For the reconstruction of the bridge carrying Denmark Hill over the London Brighton and South Coast and the South-Eastern and Chatham Railways, near Denmark Hill station, in connection with the construction of the authorized tramways from Camberwell Green to the junction of Lordship Lane and Crystal Palace Road, for the London County Council:—
 W. Moss & Son, Ltd., Loughborough ... £7,999 12 0
 J. Strachan, Cardiff ... 6,490 0 0
 Pedrette & Co. ... 6,216 9 0
 Westminster Construction Co., Ltd. 5,658 14 10
 A. Thorne ... 5,594 18 7
 Heenan & Froude, Ltd., Manchester ... 5,366 16 2
 J. Jackson & Co. ... 5,334 4 9
 S. Kavanagh & Co., Surbiton ... 5,265 16 9
 Wilkinson Brothers ... 5,223 0 0
 Tilbury Contracting & Dredging Co., Ltd. ... 5,059 19 9
 G. Hay & Co. ... 5,029 9 2
 Muirhead, Greig & Matthews ... 5,010 2 4
 A. Fasey & Son ... 4,961 5 0
 H. Woodham & Son, Leytonstone ... 4,959 14 4
 Johnson & Langley, Leicester ... 4,868 5 0
 * Recommended for acceptance. [Rest of London.]

Newcastle.—Accepted for the erection of dwellings for the working classes, at Walker Road, for the Corporation:—
 W. Franklin & Sons, Ltd. ... £18,175 4 6

Penarth.—For the erection of a new Wesleyan chapel and schools, &c., on the corner of Albert Crescent and Albert Road. Mr. Henry Bugden, F.R.I.B.A., architect, 95, St. Mary Street, Cardiff:—
 W. Thomas & Co., Cardiff ... £13,500
 W. Williams, Cardiff ... 13,400
 J. Hatherly, Bristol ... 13,200

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ALFRED CARTER & CO., LIVERPOOL.

Shepton & Sons, Cardiff ... £12,397
 Smith, Jones & Sons, Pontypridd ... 12,260
 D. Davies, Cardiff ... 11,554
 E. Turner & Sons, Cardiff ... 11,488
 G. Hallett, Cardiff ... 11,450
 J. E. Evans, Cardiff ... 10,900
 J. Jones, Penarth ... 10,770
 E. T. Bevan, Penarth ... 10,700
 D. G. Price, Penarth ... 10,600
 * Accepted provisionally.

Royston.—For the erection of a house on Sun Hill, for Mr. E. R. Burdon. Messrs. Rutter, Sons & Lloyd, architects, Bury St. Edmunds and Cambridge. Quantities by Mr. Sidney Naish, Bury St. Edmunds:—
 Bell & Sons, Cambridge ... £2,054
 Gimson & Son, Royston ... 1,998
 Mason & Son, Haverhill ... 1,926
 F. Newton, Hitchin ... 1,827
 Oak Building Co., Cambridge ... 1,817
 Jacklin & Co., Royston ... 1,792
 Coulson & Lofts, Cambridge ... 1,769
 * Amended estimates accepted subject to sundry omissions.

Rye.—For building a water-tower, Rye workhouse, for the Rural District Council. Mr. E. J. Cory, surveyor:—
 Ellis Brothers, Rye ... £1,187 10 0
 NOTE.—This includes the laying of water main.

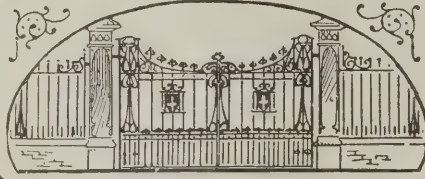
Twickenham.—For the adaptation of the mansion at Marble Hill for refreshment purposes and shelter, for the London County Council:—
 H. Haynes, Alpertown ... £1,795 0 0
 E. Proctor & Son ... 1,690 0 0
 Franks & Simon, Ltd. ... 1,554 0 0
 Higgs & Hill, Ltd. ... 1,484 0 0
 T. G. Sharpington ... 1,478 0 0
 J. J. Richards ... 1,395 0 0
 The Victoria Sanitary Engineering Co. ... 1,319 0 0
 John Barker & Co., Ltd. ... 1,317 0 0

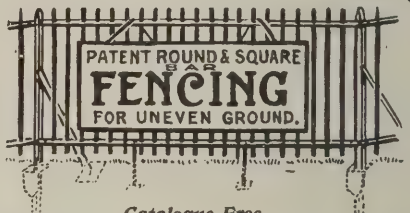
Marrison & Harvey ... £1,172 10 0
 T. J. W. Jessom & Sons, Twickenham ... 1,169 0 0
 Eldridge & Son, Twickenham ... 1,134 0 0
 Spiers & Pond, Ltd. ... 1,120 0 0
 H. C. Payne ... 1,038 0 0
 J. W. Brooking, Richmond ... 919 0 0
 Chambers Brothers ... 775 0 0
 J. Christie ... 767 0 0
 * Recommended for acceptance. [Rest of London.]

Electrical Manufacture of Rivets.—Messrs. Macfarlane & Whitfield, of Dunston, have just had completed by Messrs. Bruce Peebles & Co., Ltd., an electrical installation for the manufacture of rivets.

A steel Suspension Bridge over the Mersey at Warrington is to be erected by Messrs. T. Piggott & Co., of Birmingham. The bridge will have a span of between 200ft. and 300ft., and a clear headway of about 80ft. It will be built from plans drawn up under the supervision of the company's chief designing engineer, Mr. E. A. Candy, which were awarded the premium of £25 offered in competition. More than 100 designs were submitted. The work is to be finished next year, and will be inspected by the American Association of Engineers on their visit to this country in the early part of the summer.

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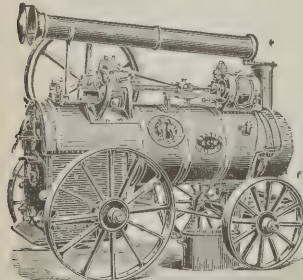
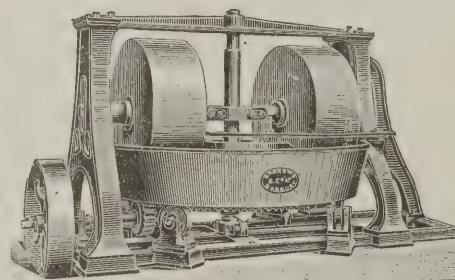
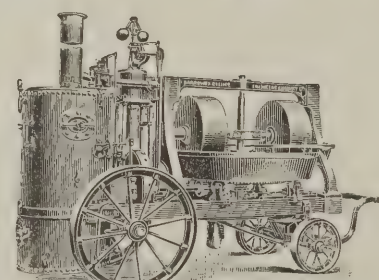
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THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

November 15, 1905. Vol. 22, No. 562.

6, Great New Street, Fetter Lane, E.C.

Summary.

Some tests which have been made at Chicago serve to show that in sand for mortars and cements, clay in limited quantities, say not more than 12 per cent., is beneficial. The best mortar sand is one with sharp corners, rough surfaces, and grains neither all coarse, all medium nor all fine, but with the proper mixture of these sized particles. The sand also need not be washed. (Page 285.)

The Co-Partnership Tenants' Housing Council exists, not as a commercial body, but to promote the laying-out of new housing estates so as to provide open spaces—two gardens being allotted to each house. Societies on this basis are established at Ealing, Sevenoaks and Garden City, and are in contemplation for Birmingham, Bournville, Berkhamsted and Manchester. (Page 287.)

The foundations of Liverpool Cathedral are expected to be completed by March 1st next, when the building of the cathedral proper will be commenced. (Page 284.)

The Dean and Chapter of Winchester Cathedral have now received the reports of Mr. Colson, Mr. T. G. Jackson and Mr. Francis Fox, who confirm the statements about the dangerous condition of the building. The mischief is most serious in the south wall of the presbytery, the settlement being attributed partly to insufficient buttressing of the vaulting and partly to the untrustworthy foundations. (Page 288.)

An account of the various new Government buildings in progress in different parts of London is given on page 288.

Ingram House, Stockwell, the first of its kind erected by a company formed for the purpose of providing residential clubs for young men, has now been completed. The plan is that of a St. Andrew's cross. Accommodation in the main building is provided for 208 residents, with staff in addition. (Page 283.)

In the concluding article dealing with new theories of architecture Mr. Claude Bragdon elaborates a theory called that of *Yo* and *In*, these being the Japanese terms for things masculine and feminine. *Yo* is intended to designate that which is simple, direct, primary; *In* that which is complex, indirect and passive. The expression of these terms is shown throughout all styles of architecture. (Page 276.)

The next Arts and Crafts Exhibition will probably be opened on January 15th next at the Grafton Gallery. (Page 284.)

Why not Office Towers?

WHY not build office towers? The American skyscraper, of course, becomes practically a tower, more especially as regards the portion above surrounding buildings, but the office tower we now suggest is quite a different structure, one planned with the special purpose of securing abundance of light and air to the rooms. That is not the case with the skyscraper, because right in the midst of the structure there may be rooms as gloomy and ill-ventilated as any in city basements: and it is just that evil which needs to be got rid of in office buildings. City life necessarily means congestion. Buildings are packed together as tight as possible, so that landlords can get the utmost revenue from every scrap of space. But for the present there is no tax on the air, and as a consequence on costly sites great pillars of rooms are built to meet the needs, just as in housing there is one method of spreading the people out thin in little houses (as in suburban and country districts), and another method of piling them on top of one another (as in city tenements). Both methods are the outcome of conditions, but there can be no doubt which is the better. The curse of the tenement is the want of light and air: and the same curse belongs to modern office buildings. Men and women are compelled to spend most of their lives in rooms so placed that they secure neither sunlight nor free air without a draught. We suggest, therefore, the office tower as a solution. It could be planned in several ways. For example, it might consist of a series of rooms arranged one above the other inside the tower, with stairs and lifts in projections at the angles; or the stairs and lifts might be arranged in the centre with an office on either side; or four towers, each with a room on every floor, might be grouped around a stairs and lift block in the centre. But whatever the arrangement, the particular object to be secured is abundance of light and air. In the case of the tower with single rooms one above the other there could be a window on each face, so that according to the direction of the wind such openings could be closed or opened so as to secure "the open window" without draught; and the same could be done with the other suggested arrangements. Of light of course there would be abundance, more especially at the heights above adjoining buildings—and there is no reason why these towers could not be carried 300ft. high—which is about the

height of the campanile of the new cathedral at Westminster. Of their architectural appearance in a city there is much to be said, but we cite only the beautiful tower of the town hall at Verona as an example of the splendid effect obtainable; while as to fire, each room could be rendered fire-resisting and a fire even allowed to burn itself out there without danger to those above or below. A city of spires we already know, but a city of office towers is a suggestion of what might be, and may perhaps be.

The Architect's Position in regard to Machinery.

ARCHITECTS nowadays are called upon to accommodate a good deal of machinery in buildings. Certain classes of buildings, in fact, are designed primarily to house machinery, such as boiler-houses, engine-houses, electric-light stations, &c., saw-mills, printing works, and factories of all kinds. Where the form of building is determined by the machinery the work has got into the hands of specialists who know enough not to make the many foolish mistakes that are so commonly found in architects' plans when machinery is concerned. It is remarkable that the architectural profession has not given more attention to the subject by having papers read before the societies, dealing with different classes of machinery. The many firms who install this necessary portion of the equipment of modern buildings cite instances where they have been hampered by the ignorance of architects who have omitted to consider machinery in any way, having simply provided a room of any shape or size that happened to be convenient. Any hole or corner was considered suitable, and the engineers were left to get over their troubles as best they could. Everyone has heard of the mouldings that come in the way of steam pipes, necessitating bends which cause loss of efficiency; the partition walls and piers which prevent boilers or engines being placed in proper relation to each other; and the usual cutting away. How frequently, for instance, have floors to be cut to allow for lifts?—even if a hole is provided it is only the size of the cage, and all the paraphernalia is forgotten. It should be a necessary part of a student's training in architecture to go through a course of lectures on the elements of machinery. It need not be very deep, but just sufficient to let the architect realize when he should consult with the engineer-specialist in the preparation of a design.

THE LAW OF CONSONANCE REPETITION & VARIATION



CHATEAU MAUMONT—THE CENTRAL PAVILION WITH ITS TWO TOWERS ECHOES THE ENTIRE FAÇADE WITH ITS TWO TOWERS

Laws of Beauty.

Three is pre-eminently the number of architecture. The division of a composition into three related parts is so universal that it would seem to be the result of an instinctive effort of the human mind. The twin pylons of an Egyptian temple, with the entrance between, for a third division, correspond to the two towers of a Gothic cathedral and the intervening screen wall of the nave. In the palaces of the Renaissance a threefold division, obtained vertically by means of quoins or pilasters and horizontally by means of string-courses, was very common,

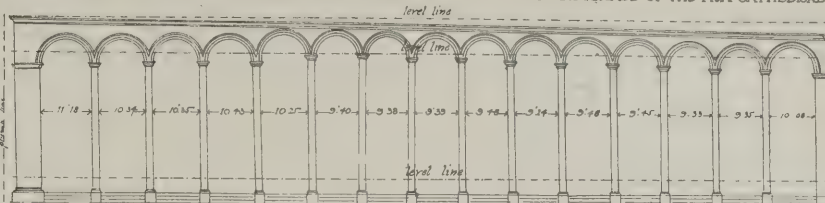
as was also the division into a principal and two subordinate masses. The orders are divided threefold into pedestal or stylobate, column and entablature; and each is again divided, the first into plinth, dado and cornice; the second into base, shaft and capital; and the third into architrave, frieze and cornice.

In nature a thing is echoed or repeated in all its parts, and such recurrences, such inner consonances, are common in architecture also. The channelled triglyphs of a Grecian Doric frieze echo the fluted columns below. The balustrade which crowns a colonnade is a repetition, in some sort, of the colonnade itself. The modillions of a Corinthian cornice are altered and elaborated dentils. Each pinnacle of a Gothic cathedral is a little tower with its spire.

Ruskin says: "All good Gothic is nothing more than the development . . . of the group formed by the pointed arch for the bearing line below and the gable for the protecting line above . . ." In classic architecture it is the column and entablature which constantly recurs.

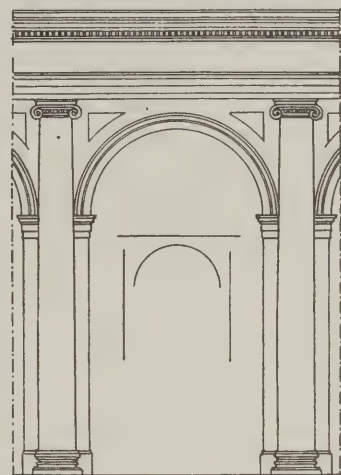
This law of consonance is more obscurely present in architecture in the form of recurring numbers—identical geometrical figures, parallel diagonals, &c. It has to do also with the style and scale of a building—the adherence to substantially one

THE LAW OF DIVERSITY IN MONOTONY. EXEMPLIFIED IN THE LOWER ARCADE OF THE PISA CATHEDRAL



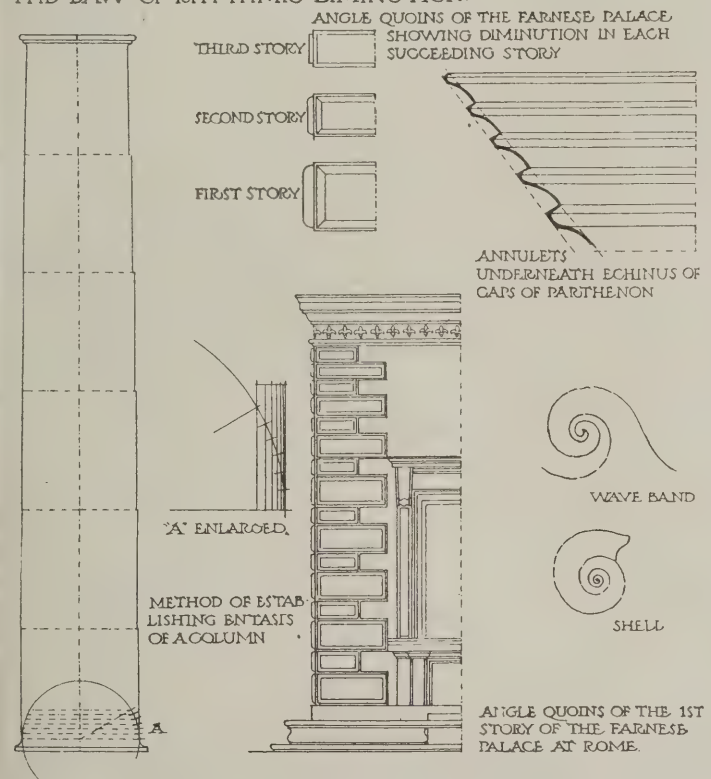
FROM PROFESSOR GOODYEAR'S SURVEY OF THE SOUTH WALL OF THE PISA CATHEDRAL, SHOWING VARIATION IN HEIGHTS AND WIDTHS OF THE ARCHES OF THE ARCADE, AND THE DIP OF THE HORIZONTAL STRING COURSE IMMEDIATELY ABOVE.

THE LAW OF TRINITY.



A ROMAN IONIC ARCADE BY VIGNOLE—THE COLUMN, THE ENTABLATURE AND THE ARCH CORRESPOND TO LINES VERTICAL, HORIZONTAL AND CURVED

THE LAW OF RHYTHMIC DIMINUTION.



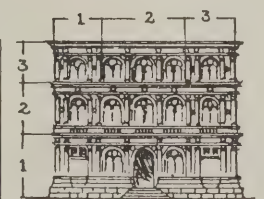
ANNULETS UNDERNEATH ECHNUS OF CARYATID PORCH OF PARTHENON

ANGLE QUOINS OF THE 1ST STORY OF THE FARNESE PALACE AT ROME

THE LAW OF TRINITY: A THREEFOLD DISPOSITION OF THE PARTS OF A BUILDING—



GREEK—THE ERECHTHEUM.

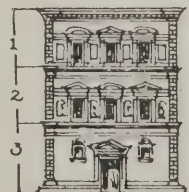


ITALIAN RENAISSANCE PALAZZO VENDRAMIN-CALERGI AT VENICE

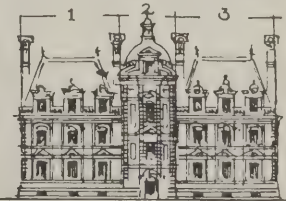


GOthic—NOTRE DAME.

EGYPTIAN—FRONT OF TEMPLE

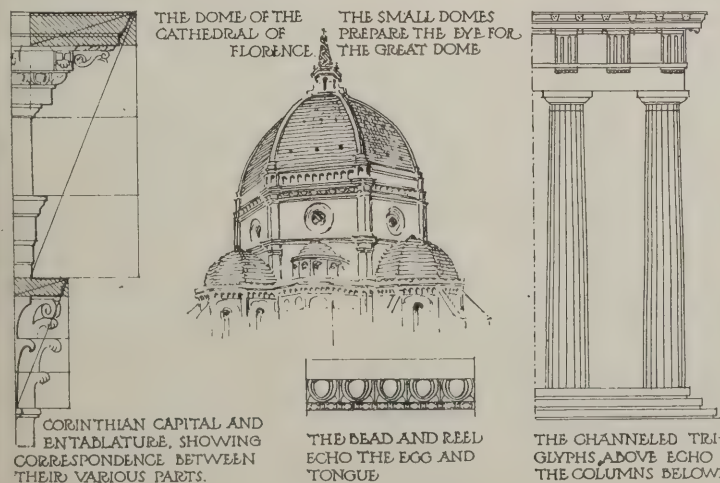


PALAZZO BARIOLINI, FLORENCE



FRENCH RENAISSANCE-CHATEAU DE BEAUMESNIL.

THE LAW OF CONSONANCE: REPETITION WITH VARIATION



THE DOME OF THE CATHEDRAL OF FLORENCE

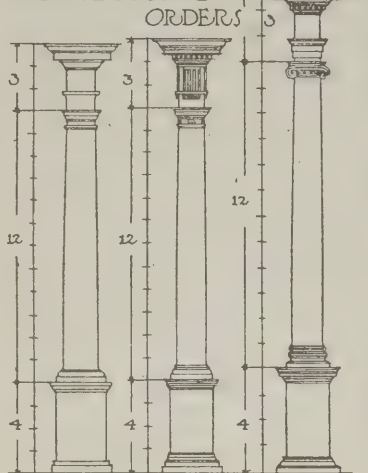
THE SMALL DOMES PREPARE THE EYE FOR THE GREAT DOME

CORINTHIAN CAPITAL AND ENTABLATURE, SHOWING CORRESPONDENCE BETWEEN THEIR VARIOUS PARTS.

THE DEAD AND REEL ECHO THE EGG AND TONGUE

THE CHANNELLED TRIGLYPHS ABOVE ECHO THE COLUMNS BELOW

THE NUMERICAL BASIS OF THE ARCHITECTURAL ORDERS



THE TUSCAN, DORIC, AND IONIC ORDERS ACCORDING TO VIGNOLE—PROPORTIONS DETERMINED BY THE NUMBERS 3, 4, AND THEIR CONJUNCTIVE NUMBER, 12—

NUMERATION IN GROUPS EXPRESSED ARCHITECTURALLY



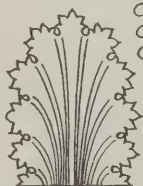
A BLIND ARCADE IN THE SOUTH TRANSEPT OF THE CHAPEL OF LINCOLN CATHEDRAL



PALAZZO PRATESESI—SAN GIMIGNANO

RENAISSANCE ORNAMENT

ARCHITECTURAL ORNAMENT CONSIDERED AS THE OBJECTIFICATION OF NUMBER



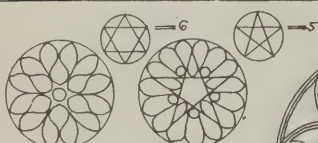
TWO

MULTIPLICATION IN GROUPS OF FIVE



THREE

ALTERNATION OF THREE AND SEVEN



DEAUVAIS CATHEDRAL BASED ON THE HEXAGRAM, OR NUMBER 6, WITH MULTIPLES 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100

ROSE WINDOW IN WEST TRANSEPT OF THE CHURCH OF ST OVEN ROUEN: BASED ON THE GRAPHIC SYMBOL FOR THE NUMBER SEVEN

A NUMERICAL ANALYSIS OF GOTHIC TRACERY

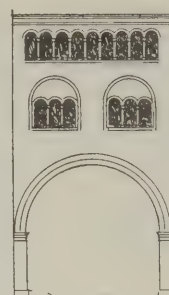
method of construction and one manner of ornament throughout, just as in music the key, or chosen series of notes, may not be departed from except through proper modulations.

Another principle of natural beauty which finds frequent illustration in architecture, particularly in Byzantine and Gothic work, is that of diversity in monotony, a perceptible and piquant difference between the individual units belonging to a single type or species. The metopes of the Parthenon frieze, seen at a distance, must have appeared very much like one another, yet each is a separate work of art. So also are the capitals to the columns of the beautiful sea arcade of the Venetian Ducal palace; unlike in contour, they differ widely in detail and unfold a Bible story. In Gothic cathedrals and monastery cloisters a teeming variety of invention is hidden beneath apparent uniformity. The gargoyles of Notre Dame make similar silhouettes against the sky; but seen near at hand, what a menagerie of monsters! The mediæval builders of Italian churches varied the sizes of the arches in the same arcade; and that this was an effect of art, and not due to accident or carelessness, Ruskin long ago discovered, and the more recent Brooklyn Institute surveys under Professor Goodyear have amply confirmed his view.

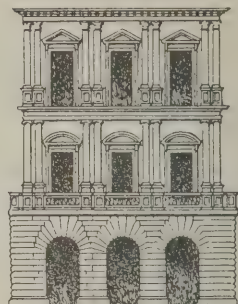
Another law is that of rhythmic diminution. There is in nature and art a universal tendency towards refinement and compactness of form in space, or contrarywise towards increment and diffusion. Its operation may be traced in the widening circles which appear when still water is disturbed, in the diminishing spirals of a shell, in the branching of a tree and the veinings of a leaf, no less than in the decreasing sizes of the pipes of an organ or in the spacing of the frets of a guitar. The entasis of a column is determined by this law; the spiral of an Ionic volute and the annulets of the Parthenon caps variously illustrate it. In the recognition of this principle a building is often made to grow lighter and finer from the ground upwards: an end attained by various devices—in the Riccardi palace by diminishing the rustication of the ashlar in successive storeys; in the Farnese by reducing the sizes of the angle quoins; in an Egyptian pylon by simply battering the wall; and in a Gothic cathedral by a kind of segregation not unlike that to which a tree is subjected—the strong, plain base corresponding to the trunk, and the multitude of delicate pinnacles and crockets to the outermost twigs and branches.

The Arithmetic of Beauty.

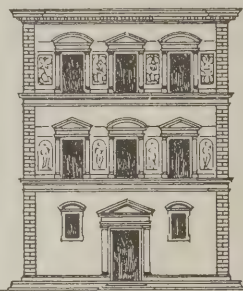
Although architecture is based primarily upon geometry, it is possible to express all spatial relations numerically, for arithmetic and not geometry is the universal science of quantity. It is true that the trained eye and not an arithmetical formula determines what is and what is not beautiful proportion: nevertheless the fact that the eye instinctively rejects certain proportions as unpleasing and accepts others as satisfactory is an indication of the existence of laws of number not unlike those which govern musical harmony.



THE BROLETTA AT MANTUA



PALAZZO UGUCCIONI AT FLORENCE



PALAZZO BARTOLINI, FLORENCE



PALAZZO TACCONI, BOLOGNA

VARIOUS PALACE FAÇADES—3 USED AS A MULTIPLE

Numbers, advancing towards infinity singly and in groups (expressed by the multiplication table), at certain stages of their progression come into relation with one another. For example, an important conjunction occurs in 12; for of a series of twos it is the sixth, of threes the fourth, of fours the third, and of sixes the second. It stands to 8 in the ratio of 3:2 and to 9 of 4:3. It is related to 7 through being the product of 3 and 4, of which numbers 7 is the sum. 11 and 13 are not conjunctive numbers. 14 is so in the series of twos, fours and sevens; 15 is so in the series of fives and threes. The next conjunction of 3 and 4 and their first multiples after 12 is in 24, and the next following in 36, which numbers are respectively the two and three of a series of twelves, each end being but a new beginning.

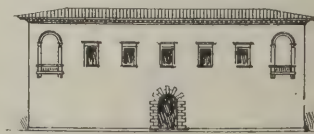
The fact that a series of threes and a series of fours mutually conjoin in 12 finds an architectural expression in the Tuscan, the Doric and the Ionic orders according to Vignola, for in them all the stylobate is 4 parts, the entablature 3, and the intermediate column 12. The affinity between 4 and 7, revealed in the fact that they express the ratio between the base and the altitude of a right-angled triangle of 60 degs., and the musical interval of the diminished seventh, is architecturally suggested in the Gothic chapels of Windsor and Oxford, whose widths and lengths are in the proportion of 4 to 7, and it finds complete



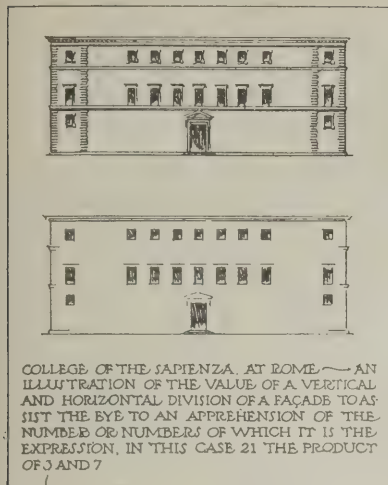
EPISCOPAL PALACE AT LEON, 7 AS 3 AND 4



PALACE IN VICENZA



PALACE IN ROME, 8 AS 3 AND 5



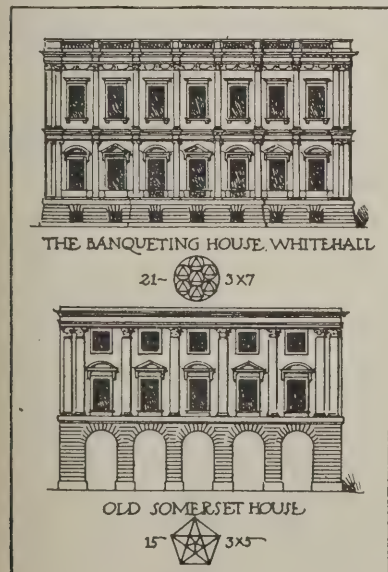
objective expression in the Palazzo Giraud, which is four storeys in height with seven openings in each storey.

The tracery of Gothic rose-windows forms perhaps the highest and finest architectural expression of number. Sometimes, as in the case of the Venetian ducal palace, the numbers involved are too great for counting, but other and different truths of number are celebrated; for example, the multiplication of the first arcade by 2 in the second, and this by 3 in the cusped arches and by 4 in the quatrefoils above them.



Seven is proverbially the perfect number. As a centre with two equal sides it is possessed of symmetry, and as the sum of an odd and even number (3 and 4) it has vitality and variety. All these properties a work of architecture can variously reveal. Fifteen also is a number of great perfection.

In conclusion, it is perhaps well that the reader be reminded that these are the byways and not the highways of architecture into which he has been led—that the highest beauty comes always, not from beautiful numbers nor from likenesses to Nature's



eternal patterns of the world, but from utility, fitness, economy and the perfect adaptation of means to ends. This truth is usually exploited in the literature of architecture to the exclusion, it has seemed to the writer, of every other. and these essays have been attempted in the hope of being able to show that along with this truth there goes another: that in every good work of architecture, in addition to its obvious and individual beauty, there dwells an esoteric and universal beauty, and that by taking more thought of this beauty we may learn to build more worthily.

NOTES ON COMPETITIONS.

Some Explanation of the Hove Affair.

THE dissatisfaction felt by competitors at the result of the recent competition for a proposed public free library at Hove, which has found vent in a flood of correspondence to the professional journals, was based upon an apparently very legitimate cause, namely, the refusal of the assessor (Mr. Belcher) to make an award and the consequent inability of the promoters to award the premiums. It is now possible to give some explanation of what up to the present has seemed such an extraordinary decision, but one cannot help feeling that it is a thousand pities that the assessor could not have seen his way to enlighten the minds of competitors upon the subject, whereby the temper of these often-sorely-tried individuals might have been sweetened and the general indignation of all interested in such affairs brought to a timely end. A recapitulation of the events which have preceded the present issue may not come as ancient history to many.

The competition was advertised and the conditions were applied for in the ordinary course, but it was found that no assessor had been engaged, in consequence of which many architects refused to compete. Nevertheless seventy-one designs were submitted, and the services of an assessor were ultimately obtained. The competitors were astonished to receive from the town clerk of Hove the following information: "I regret to say that after a careful examination of the designs sent in, he" (the assessor) "states that the authors have all either not complied with the conditions or the designs are otherwise defective, and that he is unable to make any award or advise the Council to accept any of them." Seventy-one designs, and not one worthy of acceptance! It was pointed out that although a large proportion of the designs had not complied with the conditions, others, though defective—to use the assessor's own word—might be inferred to have done so, and therefore the assessor ought to make a selection to enable the promoters to fulfil their obligation of paying the premiums. The promoters are on the horns of a dilemma, but the assessor refuses to alter his decision. And now the reasons for his conduct have been discovered, of which the following must be regarded as the gist, no official information being forthcoming.

Out of the seventy-one designs submitted about two-thirds were considered not to have conformed with clause 9 of the conditions, which reads: "In their arrangement the buildings must conform to the by-laws of the Corporation." There seems to have been a considerable misunderstanding on the part of competitors as to the interpretation of a somewhat vague by-law, in consequence of which a number of otherwise good designs were rendered unacceptable. Considering there was some reasonable excuse for this misunderstanding, the assessor endeavoured to persuade the promoters to allow the unfortunate two-thirds to modify their designs,

but this the promoters refused to do and so the assessor declined to make any award. The particular by-law in question had reference to certain open spaces and their relations to the heights of the building. If it had been quoted in the conditions, as it ought to have been, misunderstandings might have been avoided. This is only another instance of the unsatisfactory nature of the conditions.

Matters were not greatly improved by the official list of answers to competitors' enquiries, for in reference to the question as to whether an assessor would be appointed it was stated that such was the intention, but that the ultimate decision would rest with the Council (*i.e.*, the promoters).

It is extraordinary that a member of the R.I.B.A. should have consented to act where the conditions did not even approximately comply with the standard laid down by the body of which he is a prominent member; but assuming that he considered he could do as well or even better than others in assessing a competition which, though bad, might be made worse in less able hands, and excusing his action for this reason, charity of thought can go no further, and no excuse can be felt for the state of darkness in which competitors have been kept, be the motive a feeling of reticence, loyalty to the promoters, or any other. A competitor has a right, earned by his labour and monetary outlay, to an explanation of why his design has not been accepted. In the ordinary way the fact that better designs have taken precedence of his is sufficient reason, but in a case such as this, where no more satisfactory explanation is forthcoming from the promoters than the one issued, it is not too much to insist that it should be furnished by the assessor himself.

This raises a point in connection with the conduct of architectural competitions which was suggested to the Competitions Committee of the R.I.B.A. while they were sitting to draw up a revised set of "Regulations for Architectural Competitions," namely, that the award of the assessor should be published verbatim immediately after his decision. Such a procedure, if the award were sufficiently explanatory, would be extremely instructive to competitors, and would frequently serve to prevent the dissatisfaction so often felt by unsuccessful competitors by showing how and why the selections were made, the reasons for which under the existing system are not always obvious. It is to be regretted that the R.I.B.A. did not see its way to include this suggestion in their new set of regulations, which, on the whole, are otherwise an improvement upon the old ones.

Secondary School, Preston.—The designs submitted in this competition are on view till the end of this month in the Harris Free Library, Preston.

Bethania Baptist Church, Maesteg.—The building committee for this new chapel have been compelled to consider another site, which they hope to settle in a week or two.

Deptford Coroner's Court and Mortuary.—Mr. Horace T. Bonner, A.R.I.B.A., Mr. Albert L. Guy, F.R.I.B.A., and Mr. Alfred Robert, F.R.I.B.A., have been invited to submit designs for the mortuary and coroner's court proposed to be erected at Deptford, London, S.E., at a cost of £4,000. £200 will be paid to the successful architect as commission on the building, and 10 guineas each to the other two architects.

Obituary.

Mr. D. J. Ross, M.I.C.E., formerly engineer to the City Corporation for thirty-four years (from which post he retired a short time ago, being succeeded by Mr. Frank Sumner), died recently, aged 60.

Views and Reviews.

Indian Architecture.

Up to the present the subject of Indian architecture has received quite inadequate treatment. There is much interesting and instructive work in India which few persons have any idea of. The architectural student never thinks of visiting the country, although he occasionally goes as far as Turkey and Egypt in search of examples of Mohammedan architecture, of which some of the finest specimens are to be found in India. This neglect is indeed most unfortunate, because an adequate understanding of the architecture of Greece and Egypt cannot be obtained without an investigation of the movement of architectural thought and tradition which must have come from India and Assyria. Greek architecture is a culmination of the Mycenaean epoch, and the traces of this culture which have been found in Greece and the excavations in Crete and Mycenae show that there is a striking similarity between that and early Indian art, while antiquities that have come to light in Assyria, of which there is very little knowledge published, suggest a connecting link. We know, too, that before the advent of the Suez Canal the overland route to India was the chief means of communication, and the only one before the development of the Cape. Still further back there must have been great commerce, and we can trace from the history of Egypt the wars that went on between that country and Assyria. The Phœnician traders carried the arts and products of the East along the shore of the Mediterranean, and naturally must have left their traces in Mycenaean settlements in Crete. Many of the monuments of India show that there is more than a general resemblance to them, and that many of the architectural forms which we thought to be distinctive of Greece and Rome had their prototype in India. The bracket column, the fluted column, the capital, the entablature, the vault and the dome are alike to be found in India, while in the way of ornament there are all the generic forms, such as the scroll, the acanthus, the wheel, &c.

One of the general things to remark in regard to early Indian art is its naturalistic tendency, the same as is noticeable in all the early arts of the nearer and farther Eastern countries, while the influence of India

has extended, as we know, to China and Japan.

The book now before us, by Mr. Walter Del Mar, author of "Round the World through Japan," does not attempt to deal with the architecture of India, but it serves a useful purpose as a tourist's handbook, and therefore would be of value to architectural students, whom we hope may be encouraged to go to India. The information which the

author imparts regarding the many buildings, ancient and modern, is very scanty, inadequate, and often inaccurate, being based on Ferguson's "History of Indian Architecture," a book which, though it has had a great vogue, is altogether unreliable and incompetent. Many of Ferguson's descriptions and theories were based upon the records of Indian survey officers, who had not the slightest understanding of architecture, and he could not have taken the trouble to go and see the buildings for himself.

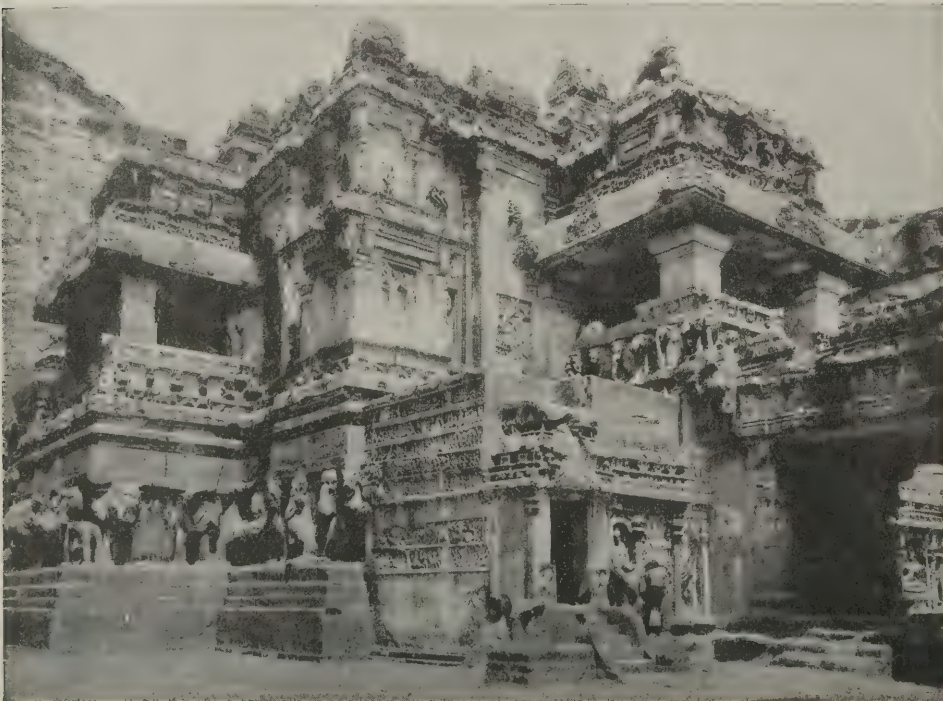
There are many styles of architecture in India—Buddhist, Brahmin and Mohammedan—these comprising numerous smaller groups such as Dravidian, Jaina and many others.

There are a number of interesting illustrations in this book, chiefly from photographs by the author, although his selection is not nearly so good as it might have been. We illustrate two views of well-known buildings in India, namely, a rock-cut temple at Ellora, the Kailasa, and another rock-cut cave temple at Karli. The date of the Kailasa is somewhere between the eighth and ninth centuries. It is a Brahminical work. The majority of the cave temples at Ellora are Buddhist, and therefore earlier. It will be noticed from the view how this temple, although excavated out of the solid rock, has been modelled on the form of a timber architecture, indicating that there must have been timber palaces and temples existing at the time, all traces of which have now been lost. Shown in this view are square piers with capitals, bracket capitals, and modelled figures and entablatures. The elaborate form of this temple proves that the architecture from which it was modelled had reached a high stage of development.

The Karli cave temple, on the other hand, is an earlier and simpler type, and is of Buddhist origin. Apparently it was the



THE KARLI CAVE TEMPLE. (From "India of To-Day.")



THE KAILASA, ELLORA. (From "India of To-Day.")

church of a monastery, and it is extremely interesting to see how the tenets of the religion led to the adoption of forms of plan which are very suggestive of the mediæval Christian church plan. In this view the mortise holes by which the wooden decoration of the building was attached can be seen. The peculiar woodwork which reduces the horseshoe opening into a semi-circular arch and other wood screens, &c., still to be found in the temple are believed to be coeval with the other work. The nave is separated from the narrow side aisles by fifteen octagonal columns on each side, while at the back of the dagoba, corresponding to the altar in Christian churches, are seven octagonal pillars forming the apse.

This book makes interesting reading, and will be found of valuable assistance to anyone contemplating a visit to India.

"India of To day," by Walter Del Mar. London: A. & C. Black, price 6s. nett.

Correspondence.

Unsatisfactory Architectural Competitions.

To the Editor of THE BUILDERS' JOURNAL.

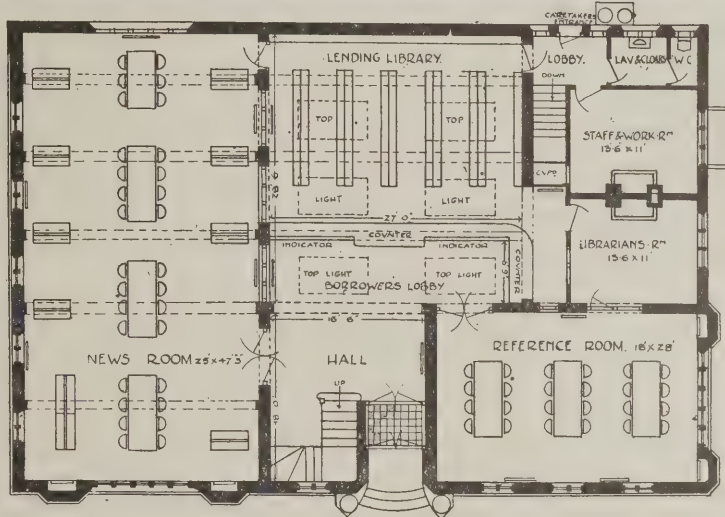
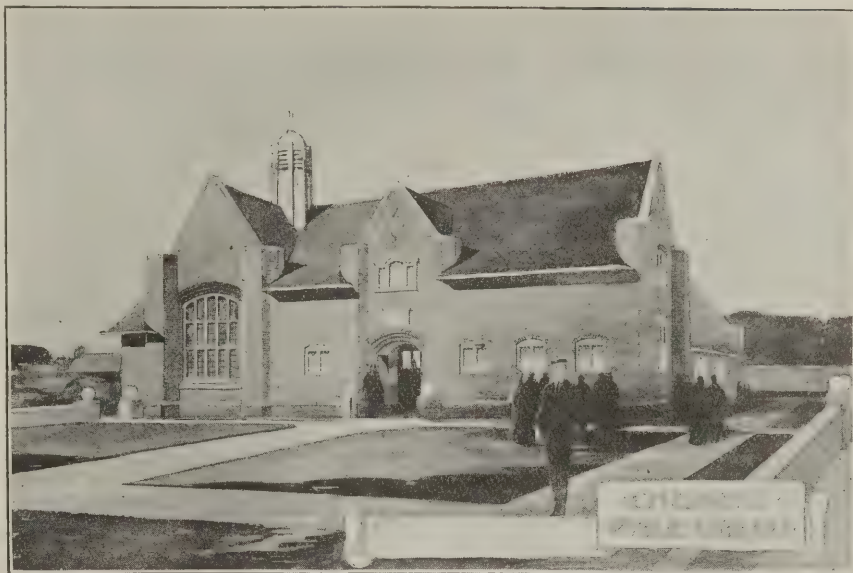
SIR,—You draw attention, I observe, to the question of unsatisfactory architectural competitions, in connection with which I should like to express my views "without prejudice," as the lawyers say, based on nearly forty years' observation.

In my judgment the competition system as now conducted has been "weighed in the balances and found wanting." It is bound to be a failure unless *limited*, with a reliable assessor, and with a payment (great or small, according to circumstances) to each competitor. There is hardly a building in the country the outcome of competition that could not have been done as well—possibly better—without a competition; neither St. Peter's in Rome nor St. Paul's in London was the outcome of one. Why then should the brains, time and money of hosts of young architects be flung away for such inadequate results? Would tailors be so foolish as to make suits of clothes for their clients to select from in the same way and submit to the return of all those that did not in the judgment of the assessor (to wit, the said client) fit to perfection? The present condition of assessors seems to be getting almost as hopeless as that of the competitors themselves.

Judging by the angry letters one reads, competitions appear to have much in common with lotteries, except that they are not illegal.—Yours truly,

E. SWINFEN HARRIS, F.R.I.B.A.
LONDON.

The Transactions of the Edinburgh Architectural Association.—The concluding part of the third volume of these transactions has been forwarded to us. A noteworthy contribution is the paper on Cockerell by the late Mr. Brydon, with some illustrations.—The opening meeting of the session was held on Wednesday last, Mr. Tarbolton presiding. Mr. John Keppie, F.R.I.B.A., read a paper on "Moorish Architecture in Spain," this paper having been written after a visit several years ago to Spain. Mr. Keppie described some of the principal buildings in Madrid, Cordova, Granada and Seville. Moorish architecture, he said, referring more especially to the Alhambra, spoke to the senses rather than to the mind; it pointed to voluptuousness rather than to thought. It resembled a brilliant charm, a caprice of the genii who might be imagined to have disported themselves in the network of stone, in the delicate openwork, light fringes, embroideries, &c. The Alhambra was an Oriental poem.



GROUND FLOOR PLAN

SCALE
10 20 30 40 50 60 70 80
FEET

SECOND-PREMIATED DESIGN FOR CHESHUNT PUBLIC LIBRARY. ERNEST A. SUDBURY, ARCHITECT.

CHESHUNT LIBRARY COMPETITION.

WE publish in this issue the first- and second-premiated designs in the competition for a public library at Cheshunt, in Hertfordshire. More than one hundred and eighty designs were submitted for this little building, the assessor being Mr. J. S. Gibson, F.R.I.B.A. The conditions stated that the author of the design placed first would be employed to carry out the work (unless a sufficient reason existed to the contrary) and would be paid the usual commission of 5 per cent. according to the R.I.B.A. schedule; the author of the design placed second being paid the sum of twenty guineas, and the third ten guineas. In the event of the council giving no instructions to proceed with the work within twelve months after the award, the selected architect would be paid the sum of £45, such sum to merge into his commission of 5 per cent. if the building were carried out from his design.

The site proposed for the library is known as the Manor House, Cheshunt. In the first-premiated design, by Mr. J. Myrtle Smith, of Chelsea, the principal elevation faces Turner's Hill, and the entrance has been made on this, the west side. The plan has been set out so that complete supervision may be effected by the staff from the lending library, which

is directly opposite the entrance, the lending library and the entrance hall being thrown into one so as to give a spacious apartment and avoid unnecessary glazed partitions. The news- and magazine-room to the left is separated by a glazed screen up to the ceiling, with entrance from the hall and with a staff access door from the lending department. The reference-room on the right has a service counter directly adjoining the lending library for the issue of reference books; also an access door for the staff. The ladies' room on the first floor (which was one of the requirements of the conditions) is reached by a stair from the entrance hall. Below the staff room is placed the heating chamber with access stair. The building is to be built with local red facing bricks, five courses to the foot, with white Portland stone base, string-courses and central feature; roofs to be green Westmorland slates, with lead ridges and finials. The architect estimates the building to cost £2,900 inclusive of heating, ventilating, apparatus, lighting and water.

The second-premiated design, by Mr. Ernest A. Sudbury of Nottingham, is estimated to cost £2,770, leaving £230 for interior fittings. The accommodation is shown by the plan above. The third-premiated design was by Mr. R. Wylie, of Gateshead.

LIFTS.

Hydraulic Power v. Electric Power.

WE have received a very interesting pamphlet issued by the London Hydraulic Power Co. on the question of the comparative efficiency and economy of high-pressure water power and electric power for use in connection with lifts and cranes. It is a question which is of considerable interest to a great many people at the present time, as the use of lifts of some kind has become universal in public buildings and is largely extending in private houses also.

Of course, the London Hydraulic Power Co. approach the matter from their own standpoint. The fact, however, as pointed out in their pamphlet, that they have now run over 150 miles of main for the express purpose of supplying power for working machinery, and that there are now nearly 6,000 machines working from their system, sufficiently indicates that their supply has been of immense value in providing motive power and has been very largely taken advantage of.

Electric Power a Serious Competitor.

The introduction and distribution of electric power of course is now proving a very serious competitor, and the advocates of electricity make for it very high claims which naturally tend to threaten the practical monopoly which has been enjoyed by the London Hydraulic Power Co.

In these circumstances a comparison of the various claims made will probably be of some service.

The Hydraulic Power Co. supply through the greater part of London water suited for driving machinery, especially lifts and cranes, at a pressure of 700 lbs. per sq. in., which is obtained by pumping into accumulators at several different stations, the accumulators being loaded to give the requisite pressure per square inch, and the water being delivered at the standard pressure throughout the area supplied. The advantages of working at a high pressure of this description, as compared with the pressure from the ordinary street main of about 30 lbs. to 40 lbs. per square inch, will be obvious, especially as the pressure can be always relied upon instead of fluctuating, as is frequently the case with the ordinary mains.

Hydraulic Power on a Sliding Scale.

The Hydraulic Power Co. supply this motive power on a sliding scale, which varies from a minimum of 25s. per quarter for 3,000 gallons down to about 1s. 6d. per thousand gallons, in proportion to the quantity of water which is consumed, so that for large establishments the economy is greater than for smaller ones.

On the other hand, the electric supply companies are now providing, for the greater part of London, continuous current suitable for driving reversing motors at prices varying from 3d. per unit to 1½d. per unit, at which price some of the borough councils are supplying current for motive power. Current for power purposes is universally supplied at lower rates than for lighting, as the greater part of the demand occurs during the day, when the lighting is not greatly in use, the power supply being intended to furnish a means of employing the plant at the station instead of allowing it to be idle, and thus to provide even at a low figure a profitable revenue. There is a fallacy in this argument, however, for during the winter months the maximum demand for light and power in many cases occurs about the same time, and additional plant is therefore required for the power load.

Both Sides of the Case.

After carefully considering the various arguments introduced in the Hydraulic Power

Co.'s pamphlet, and comparing it with other statements to which they draw attention, it is evident that there is a good deal to be said for both sides of the case. Generally speaking, a hydraulic machine is simpler and has fewer complicated working parts than an electric machine, and consequently for heavy and rough work it is less liable to require adjustment and can be more safely entrusted to unskilled attention.

With the ordinary hydraulic lift, operated by hand-rope control, there is a certain amount of labour in stopping or starting the lift and a considerable amount of judgment required in accurately reaching the landing level: this, of course, is easy where the lift has a regular attendant who is always working it—but with an electric lift it is possible to provide an electric control that may be worked by a car switch with a handle which is self-centering when released, so that it is always perfectly certain when the current is completely shut off; and it is also possible to use an automatic push-button control which can be operated by a lady or a child without the slightest exertion, the lift being started by pressing a button and stopping automatically on arrival at the floor desired. It is easy to fit interlocking arrangements to the doors to prevent the lift being started when any door is open or to prevent the doors being opened when the lift is not there, as this can be simply arranged electrically in connection with a controller of this type. An arrangement of this kind can, however, be fitted to a hydraulic lift at an additional expense and complication, the same as with the electric lifts, an electric supply for this control being necessary, but the fitting is not quite so easy as with an electric lift.

With an electric lift there is no possibility of the lift creeping, which may occur sometimes with a hydraulic lift in case of leakage from the valve or gland.

Caution advisable in accepting Figures.

The main advantage, however, claimed on behalf of electricity is the cheapness of the motive power, and there is no doubt that at the very low rates now in force this advantage is sometimes considerable. A certain amount of caution must, however, be observed in accepting figures which are sometimes published showing the cost of running electric lifts, as, unless the current is taken on some definite basis, the figures are not altogether reliable.

The most satisfactory method of testing the current consumption of an electric lift, and the one usually adopted by leading consulting engineers at the present time, is to run the lift with a specified load a sufficient number of journeys to consume one or more units of current as registered by the meter, and, of course, this gives a reliable test as to the total consumption of all parts of the machine.

It is claimed, with a certain amount of accuracy that in an electric lift the power consumed is more in proportion to the duty being performed than is the case with a hydraulic lift which uses the same amount of power-water with any load in the cage. It must, however, be borne in mind that with an electric lift, in which half the live load is counterbalanced, a very large proportion of the current is consumed in driving the machinery and the working parts, and consequently the variation in current consumption owing to difference in load is not really very large. An electric lift under these conditions, run a good number of journeys with full load up and down, half load up and down and no load up and down, would give much the same current readings in each case. The maximum duty would, of course, be required when the cage was ascending with full load and descending empty, which would seldom happen in the case of a passenger lift, where

there is always at any rate the attendant in the cage. A diagram in the pamphlet illustrates some of the peculiarities of the consumption of current in electric lifts.

In considering the comparative economy of hydraulic and electric lifts there are other factors which have to be taken into account, such as the amount of duty the lift is likely to perform and the number of lifts required in the building, these being important features owing to the sliding scale adopted by the Hydraulic Power Co.

There is also another point to consider in the case of high-speed lifts, namely, that the first cost of an electric lift increases in proportion to the speed, as a larger motor and gear are required; but with a hydraulic lift the size of the machine and the water consumption remain the same, the speed being regulated by the size of the supply pipes.

In the United States, where very high buildings exist and a number of lifts are employed in one building, the latest practice is to use high-pressure hydraulic machinery in order to get high speeds of 400ft. to 500ft. per minute without unduly increasing the cost of the machinery, and also because at these high speeds the wear on hydraulic machines is much less and there is greater safety.

Comparative Costs.

In order to give some idea as to the comparative cost, we may take as a basis case a passenger lift arranged to carry 7½ cwt. a height of about 60ft.

The cost of an electric lift to do this duty at a speed of about 150ft. per minute would be about £320, and the lift would make about twenty-two complete trips (up and down) per unit of current consumed. The cost of a similar lift to run at a speed of 250ft. per minute would be about £375. The cost of a high-pressure hydraulic lift would be about £220 and the water consumption would be about 6 gallons per trip.

The running cost of the hydraulic lift, assuming that the lift made 100 full journeys per day and taking seventy-five days per quarter, would come out about £9 per quarter. An electric lift making the same number of journeys with equal loads up and down, and taking current at 2d. per unit, would cost about £2 17s. per quarter, showing a considerable saving in favour of the electric lift; but from the pamphlet of the Hydraulic Power Co. it appears that such a calculation is not accepted as correct, because in practice equal loads per trip are not taken up and down, and that, in consequence, the current cost may sometimes be considerably increased. There is evidently something in this contention, so that the cost for the electric lift might vary from about £3 to about £5 per quarter.

If, on the other hand, there were two similar lifts working in the same building or in buildings owned by the same proprietors and doing the same duty, the cost of the hydraulic power would then come out about £14 15s. per quarter and the electric current from about £6 to £10.

If there were three lifts, hydraulic power would come out about £20, against from £9 to £15 for current, and of course as the number of lifts increased the difference between the electric and hydraulic power would correspondingly reduce. At 1s. 6d. per 1,000 gallons the hydraulic cost would only be £3 7s. 6d. per lift.

Specimen Figures.

There is, however, another item which is frequently overlooked, and that is the extra allowance which should be made for interest and depreciation upon the greater first cost of the electric lift.

To give a clear view of this we give the following specimen figures based upon the lift considered above:—

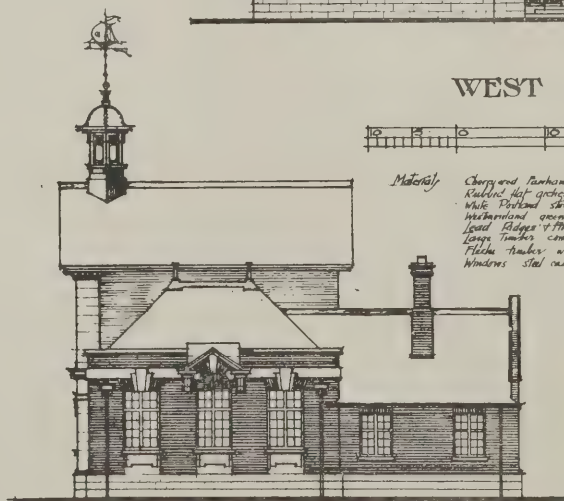
LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



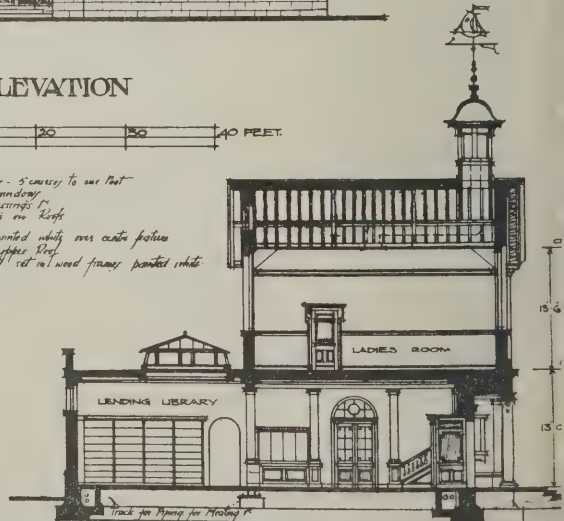
WEST ELEVATION

10 20 30 40 FEET.

Materials
Cherry and Oakum built - 5' canvas to ear feet
Kiln-dried soft spruce to window
White Portland stone dressings
Weathered green slate on roof
Lead glazing & putty
Large timbers canvas painted white over extra finish
Plebe timber with copper roof
Windows steel casement set in wood frames painted white

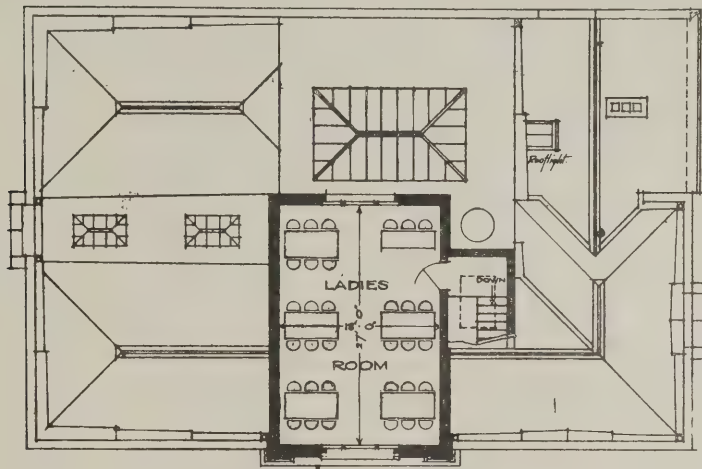


SOUTH ELEVATION



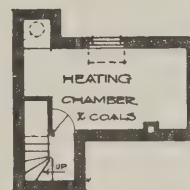
SECTION AA

PROPOSED PVBLIC LIBRARY CHESHVNT HERTS

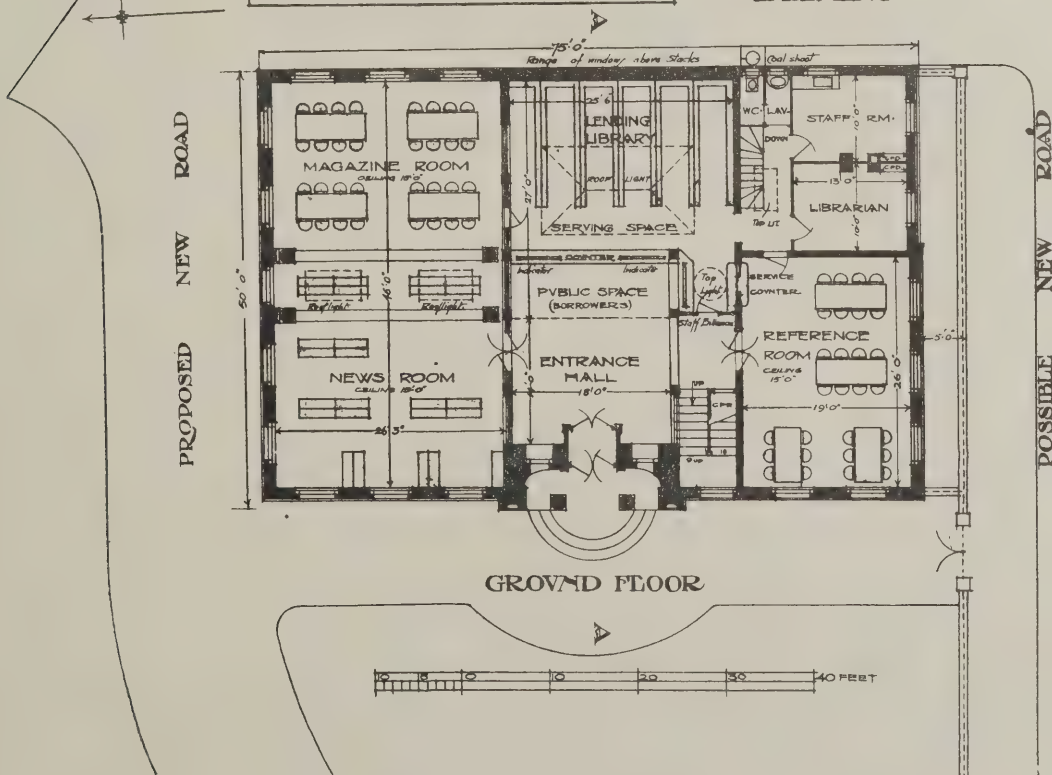


FIRST FLOOR

ACCOMODATION			
ENTRANCE MALL	14 x 13'0"	= 252	FEET SVPER
LENDING LIBRARY	27 x 25'6"	= 688 1/2	DO. DO.
— NO OF VOLUMES	12,250	STACKS 7'3" HIGH	
REFERENCE ROOM	26 x 19'0"	= 494	DO. DO.
— NO OF READERS	28		
NEWS ROOM	46 x 26'3"	= 1207 1/2	DO. DO.
— NO OF MAGAZINES	32		
— NEWSPAPERS	26		
LIBRARIANS RM.	13 x 10'0"	= 130	DO. DO.
STAFF ROOM	13 x 10'0"	= 130	DO. DO.
LADIES ROOM	27 x 13'0"	= 486	DO. DO.
— NO OF READERS	33		



BASEMENT



GROVND FLOOR

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Hydraulic Lift.			£	s.	d.
First cost	-	-	220	0	0
Working cost	-	-	9	0	0

Electric Lift. (150ft. per minute.)			£	s.	d.
First cost	-	-	320	0	0
Cost of current	-	-	£3	and	upwards.
Allow for extra interest and depreciation of 10 per cent. per annum for one quarter	-	-	£2	10	0
Taking the figure which should be compared with the cost of the hydraulic lift	-	-	5	10	0
				and	upwards.

High-speed Electric Lift. (250ft per minute.)			£	s.	d.
First cost	-	-	385	0	0
Cost of current	-	-	£3	and	upwards.
Extra interest at 10 per cent. per annum	-	-	£4	12	6
			7	12	6
				and	upwards.

If, however, there were two lifts in the same building the figures would be:—

Hydraulic Lifts.			£	s.	d.
First cost, at £220 each	-	-	440	0	0
Water consumption per quarter	-	-	14	15	0

Electric Lifts.			£	s.	d.
First cost, at £320 each	-	-	640	0	0
Current per quarter	-	-	£6 to £10		
10 per cent. on extra outlay	-	-	£5	0	0
			11	0	0
			10		
			15	0	0

High-speed Electric Lifts.			£	s.	d.
Cost of current	-	-	£6 to £10		
Extra interest and depreciation	-	-	£9	5	0
			15	5	0
			10		
			19	5	0

Other Considerations to be taken into account.

These, of course, are only specimen figures and they would not work out exactly in such ratios under all conditions but they will be sufficient to suggest that there are various considerations which should be taken into account in order to arrive at an impartial conclusion. Of course, in the case of lifts which are seldom used it would take a long time before the saving in current equalled the difference in the first cost.

As regards reliability and cost of repairs, there would probably be about an equality in the long run. A hydraulic lift requires perhaps more regular attention in the way of packing and adjusting, and probably in the earlier years would cost more to maintain in complete running order than an electric lift. On the other hand, there are more wearing parts in an electric lift; and for a long term of years, while there might be fewer regular adjustments, there would probably be some more expensive renewals, which, during the life of the lift, would work out to about the same result.

There are a number of high-pressure hydraulic lifts in London, Liverpool and other places which have been working for twenty-five years, and these are now running as well as when they were first erected. There are not many electric lifts in this country which have yet been in operation for so long a period, and it would perhaps not be safe to say that they would be in equally good condition when their life has extended to the same length.

From these suggestions it would be seen that the question as to the most suitable arrangement to adopt is largely a question of comparative considerations and conditions which vary greatly according to the requirements of the particular case. In any case it is worth suggesting that whatever form of lifting apparatus is employed it is desirable that it should be of the very best quality in order to ensure a really economical result, and that this especially applies to electric machinery, as cheap appliances of this class are almost certain to cause considerable trouble and expense in running for

a comparatively short time; and as there are a good many firms who are making and supplying parts of electrical machines, these may be purchased and put together by engineering firms who are not in a position to build a complete machine themselves, in which circumstances the various positions are not likely to give such satisfactory results as a completely designed and constructed machine by a first-class maker.

INGRAM HOUSE, STOCKWELL.

THIS is the first house erected in the south-west of London by a company formed for the purpose of providing residential clubs for young men. The building has lately been completed, having been in progress for just over two years. The site is at the rear of four large houses in the Stockwell Road.

The accommodation in the main building is for 208 residents, with staff in addition. The bedrooms are disposed in four floors placed above two floors of social rooms and administrative offices, with a mezzanine in one wing for the staff bedrooms. The lowest floor-level is 5ft. below ground, so that the basement has ample light and air. The principal club floor is thus raised 10ft. above ground, and is approached by a short flight of black Belgian marble steps starting from a vestibule at the ground level and leading up to the principal lounge. From this point the dining-room and library are reached on the left, and the smoking-room and billiard-room on the right. The plan is that of a St. Andrew's cross. The large dining-room, which will seat the 208 residents at small tables, occupies the centre and one wing, the other club-rooms mentioned above occupying the remaining three arms of the cross. In the dining-room the central feature is a high relief of one of the nine labours of Hercules. The library is completely lined with book-cupboards with oak facings, the two chimney-pieces forming part of the design. The billiard-room, which takes three full-size tables, has a high dado of white-painted deal panelling, with the chimney-pieces in oak, one of which has some carving executed by Mr. Markham from the design of the architect (Mr. Arthur T. Bolton, A.R.I.B.A.). In the smoking-room the walls for a height of about 9ft. are divided out by wood mouldings into panels framing on the main piers a set of blue and white tile panels. In all of these rooms there are panelled window seats forming part of the scheme, and where required the radiators are placed beneath the same. The various lobbies and passages are treated with cross-vaulted and intersecting plaster ceilings on wood cradling; these were executed by Messrs. Aubrey.

Bedrooms.

The two staircases to the bedrooms to the right and the left are placed at the junction of the arms with the body of the cross and are all framed in teak with solid newels rising four floors in height by four short flights of four steps, each with quarter- and half-space landings, the staircase cages of brick walls and arches forming a hexagon on plan. There is a glazed lantern over each staircase. From the nature of the plan all the bedrooms look out into the open, and there are no back or courtyard rooms, the rooms being all of equal value. There are three grades in the size, the standard being 7ft. by 10ft., but the twenty-four centre rooms are 10ft. by 8ft. and the forty angle rooms are 10ft. by 9ft., these last having two windows to each room. The rooms are all divided by solid concrete slab partitions 3ins. thick, and each has a fitted hanging cupboard and a bookcase in addition to the movable furniture.

On the asphalted roof of the building, at

a height of 63ft. above ground, a fine promenade is provided commanding an extensive view over South London.

The basement contains a lecture hall fitted as a gymnasium, having a storage cellar under the vestibule for the chairs and apparatus. The kitchens and servants' quarters occupy two arms of the cross on the other side of the lecture hall.

The building has its own water-supply from a well in the chalk, 350ft. deep, raised by a pump driven by a gas-engine, the storage tanks for the water being placed on the roof.

As regards the exterior, above a plinth of purple Luton bricks about 10ft. high the building is faced with stock bricks, with pilasters and a deep frieze and cornice in red bricks. The moulded bricks were supplied by Messrs. Lawrence, of Bracknell, most of the work being special made. The brick carving was executed by Mr. Arrowsmith in Lawrence's red rubbers to the architect's designs.

The central segmental pediment contains a high relief of Apollo, modelled by Mr. Fagan and cast in lead by Italians according to the *cira perduta* process. On either side of the main arch above the entrance are two large ovals in salt-glazed ware, deep-blue and light-green in colour, representing Youth and Age. These, together with the Four Seasons burnt in terra-cotta and used in the internal decoration of the club-rooms, were modelled in low relief by Mr. Broad, of Messrs. Doulton & Co., and at whose Lambeth potteries they were successfully fired.

The Contractors.

The general contractors were Messrs. Rudd & Son, of Grantham, the clerk of works for the first eighteen months having been the late Mr. D. Davies and for the completion Mr. Joseph Weaver. The quantities were taken off by Messrs. Widnell & Trollope, of Westminster; the constructional steel was supplied by Messrs. Dorman, Long & Co., to details worked out by Messrs. Reade, Reilly & Jackson, consulting engineers; the heating and hot-water supply, and also the fitting-up of the kitchen, was executed by Messrs. Clements, Jeakes & Co., of Bloomsbury; the deep-well water-supply was carried out by Messrs. Isler & Co.; the internal plumbing and fire service is by Messrs. Beaven & Son, of Victoria Street, S.W.; the electrical installation was executed by Messrs. Shalders & Davis, of Southampton; the gas cooking apparatus was supplied by Messrs. Fletcher, Russell & Co., of Queen Victoria Street; the oak block floors were laid by Messrs. Turpin; the electrical fittings were made by Messrs. Hands, of Snow Hill; the asphalt roof was executed by Messrs. Faldo; the cart road was laid in Granolithic by Messrs. Stuart, and the tar paved approach roads by Messrs. Constable, Hart & Co. Hall's washable distemper and Charlton white enamel paint have been used in the internal decorations; the plastering (including the decorative work in the same) was executed by Messrs. Aubrey, of Woking; the wall tiling has been supplied and fixed by Messrs. Van Straaten, as were also the black marble stairs and black and white marble paving of the vestibule; the wrought-iron staircase balustrading of the principal stairs to the club floor was made to the architect's design by Messrs. E. & R. Gittins, of Birmingham, as also the two outside lamps, in wrought copper, at the main entrance; the locks and all the ironmongery (mainly in gunmetal) and the cast-iron rain-water pipes and heads were supplied by Messrs. Lockerbie & Wilkinson, of Victoria Street; and Mr. Robert Adams has supplied the swing hinges and Davies's patent automatic lantern and gearing and fanlight openers.

A perspective and plan of the building appeared in our issue for May 11th, 1904.

Keystones.

Liverpool Architectural Society.—Last week Mr. A. Needham Wilson, A.R.I.B.A., read his paper on "Sketch Plans and Working Drawings" before this Society.

A Gigantic Statue of Justice will surmount the dome of the new Sessions House in Old Bailey. It is the work of Mr. F. W. Pomeroy, and is of bronze 20ft. high, weighing $3\frac{1}{2}$ tons.

Stones of Canterbury Cathedral to go to America.—Some of the stones which it has been found necessary to remove from the Bell Harry Tower of Canterbury Cathedral in the course of its reparation are to be sent to America for incorporation in the new cathedral at Washington.

Mr. Goodyear's Last Lecture on Architectural Refinements was delivered at Edinburgh last week. At the outset he showed photographs taken at Lanercost and Hexham, the latter, he said, being especially interesting as a valuable illustration of the outward divergence of the verticals in the choir and transepts. Mr. Goodyear then dealt with Notre Dame, showing the curves in plan in the nave, which were parallel and opposed to the thrust on the north side, and rose to the parapets of the exterior walls as high as the roof. These curves of the nave appeared to be related to the deflection of the choir of Notre Dame, which was already known to exist, but they also appeared to force a new explanation of the deflection of the choir. It was impossible to conceive that incompetence of the builders would explain these curves in plan, because the majority of French cathedrals showed absolutely true lines in the nave. He argued that these variations of alignment were intended to give picturesque effects and to annihilate the monotony of the straight line. Mr. H. O. Tarbolton, president of the Edinburgh Architectural Association, in conveying a vote of thanks to Mr. Goodyear, said that he had thrown a new light on mediæval architecture, and had given them a glimpse behind the scenes. He was convinced that Mr. Goodyear had proved his points in most cases up to the hilt, and there were many who shared that view.

An Epitome of Civil Engineering.—Sir Alexander Binnie, the new president of the Institution of Civil Engineers, said in his address to this Institution last week that civil engineering in this country only dated back to the eighteenth century. The illiterate Brindley constructed the canals which laid the foundation of inland navigation. Smeaton, a man of the highest intellect, engaged in almost every class of engineering work. John Rennie built Waterloo Bridge, and was engaged in the construction of the London Docks. Telford at one time worked as a stonemason for ordinary wages during the building of Somerset House, and afterwards became the great bridge-builder of his age. Summarizing the history of the science, the president said that as the period before 1832 was the age of road-making, canal-engineering and the beginning of docks and harbours, so the period which had since elapsed was essentially the railway epoch. Coincident with the growth of railways had been the advance in electrical science and the development of sanitary and marine engineering. It might be fairly claimed that during the Victorian era the resources of science had been applied to the needs of mankind to a greater extent than in any other age. Looking ahead, the investigations of recent years into the laws which governed the constitution of matter were gradually forming in our minds new conceptions as to the structure of all inorganic bodies, and he thought we might look for developments in the future as much unsuspected as was present-day knowledge by the scientists of the eighteenth century.

An Attractive Calendar commencing December, 1905, and continuing till December, 1907, has just been issued by Messrs. W. Summerscales & Sons, Ltd., laundry engineers, of Keighley, who will be pleased to forward one to any reader who makes application.

British School in Rome.—As the Government grant promised to this school will not be made till next April, it has been decided not to appoint anyone as director during the present season. Meanwhile, Mr. T. Ashby, jun., will be in charge of the school, and has returned to Rome to take up his duties.

Liverpool Cathedral.—At a meeting of the executive of the Liverpool Cathedral Committee held last week Mr. Gilbert Scott, the architect, reported that good progress was being made with the foundations, which would be completed by March 1st next, when the building of the cathedral proper would be proceeded with.

The next Arts and Crafts Exhibition.—The triennial exhibition of the Arts and Crafts Exhibition Society (of which the president is Mr. Walter Crane and the hon. secretary Mr. E. S. Prior, 3, Old Serjeants' Inn, W.C.) will in all probability be opened about January 15th next in the Grafton Gallery, instead of in the New Gallery as hitherto. The receiving days will be December 28th and 29th.

Change of Address.—Owing to the considerable extension of business during recent years, both at home and abroad, Messrs. Wailes, Dove & Co., Ltd., makers of "Bitumastic" enamels, have removed into new offices at 26, African House, 6, Water Street, Liverpool, where their local director, Mr. George R. Brace and his assistants, Mr. O. A. Bley and Mr. W. Nixon Porter, will continue to look after the firm's interests.

Architects and Municipal Elections.—In connection with the municipal elections at Newcastle-on-Tyne the Northern Architectural Association sent out letters to candidates asking whether or not they were in favour of municipal architectural work being carried out by local practising architects instead of by Corporation officials. Of the six elected representatives of different wards, two replied declaring themselves in favour of the Association's desires.

A.A. of Ireland.—A meeting of the Architectural Association of Ireland was held last week, Mr. Harry Allberry presiding. Mr. W. J. Fennell, M.R.I.A.I., of Belfast, delivered a lecture on "The Golden Age of Gothic Art"—the English period spanned by the Decorated and the Perpendicular.—The Green Book of the Association has just been issued. The Committee's programme for the current session includes the co-ordination and extension of the classes to enable Irish students, *inter alia*, to study for the R.I.B.A. examinations; also the formation of a museum of building materials and of a day and evening studio.

Change of Name.—The Automatic Sculpture Syndicate, Ltd., of 62 and 64, Sumner Street, Southwark, S.E., has changed its name to the Sculpture and Carving Syndicate Ltd. It was found that the use of the word "automatic" created a false impression as to the methods employed by the syndicate, and the company desire to point out that all work done by them is carved by hand, machinery being utilized only for roughing out and pointing. Special attention is given to the high-class finish of all work, and in order to ensure this the syndicate has secured the services of Mr. Courtenay Pollock, R.B.A., who personally superintends the modelling and carving of all work. The syndicate can therefore guarantee high-class work at prices considerably below the average. If desired, work can be roughed out at the firm's premises and carved *in situ*.

Builders' Notes.

A new Theatre at Cardiff is being erected in Park Place from designs by Messrs. Ernest Runtz & Ford, of London. The builders are Messrs. James Allan & Son.

Conference of Plumbers.—The half-yearly conference of the National Association of Master Plumbers of Great Britain and Ireland was held in Birmingham on Wednesday last.

Messrs. Mellowes & Co., Ltd., of Corporation Street, Sheffield, have recently been favoured with orders for glazing on their "Eclipse" patent imperishable system the roofs of new car-sheds at Derby, Glasgow University, Devonport Dockyard, extensions of works for Cammell, Laird & Co., Ltd., at Sheffield, North British locomotive shops at Glasgow, and the premises of Beardmore & Co., Ltd., at Glasgow.

Guard Rails on Scaffolding.—At the inquest held at Keighley last week upon the body of a plasterer who was killed by falling off a 24ft. scaffolding at the new Wesleyan schools in Temple Street, Keighley, the jury returned a verdict of "Death by Misadventure," but strongly urged that the Home Office recommendations should be adopted in such trades, namely, that a guard rail should be fixed to platforms above 8ft. high, and that platforms should be 18ins. wide. In this particular case the deceased was working on a single plank.

London Building Trade: L.C.C. and Revised Working Hours.—Revised working rule agreements have been made between the London Master-Builders' Association and the bricklayers, carpenters and joiners, stonemasons, plumbers, general smiths and fitters, and the working hours during the year have been altered so as to provide that forty-four hours a week shall be worked throughout the thirteen weeks of winter, except in the case of plumbers, who will work $41\frac{1}{2}$ hours a week for the first ten weeks of winter. The revised working hours came into operation as from Monday last. There are no working rule agreements between the Association and the mill sawyers', painters' and labourers' societies. The existing working rule agreement between the Association and the plasterers' society does not terminate until March 3rd, 1906, and consequently no alteration is made in the working rules of that trade. The Works Committee of the London County Council think it desirable that the trades of timbermen and scaffolders and of mill sawyers and wood-cutting machinists, who are now classified in the list of rates of wages under "various trades," should be placed under the head of "building trades," and that the rate of pay for overtime worked by the two former trades should be the same as labourers and navvies, namely, after 7 p.m. until 8 p.m., time and a half. The Works Committee also recommend that the hours of labour of the following trades inserted in the Council's list of rates of wages and hours of labour be amended, and be during the thirteen weeks of winter, commencing from Monday last, forty-four hours per week:—Carpenters, joiners, bricklayers, bricklayers (cutting and setting gauged work), masons (fixing), masons (granite work), masons; smiths, fitters, gas-fitters, &c. (In shops, general smiths and fitters to work summer hours throughout the year, should the employer desire it.) The Works Committee further recommend that the hours of labour for plumbers and their mates inserted in the Council's list of wages and hours of labour be amended, and be during the first ten weeks of winter, commencing from Monday last, $41\frac{1}{2}$ hours per week, and for the next three weeks forty-four hours a week.

SAND FOR MORTAR.

Some New Tests, and Conclusions drawn from them.

ONE would hardly have expected, says "Engineering," that in these days it would have been possible to teach engineers (or builders) anything of importance regarding the sand which they mix with their limes and cements; and yet a series of tests carried out during the last few years by Mr. James C. Hain, engineer of masonry construction to the Chicago, Milwaukee and St. Paul Railway Co., seem to show that there is still something to be learnt about it. We have become so much accustomed to the idea that the only kind of sand to use when making mortar or concrete of the first quality is one which is coarse and sharp, as well as free from clay, that any other kind is never mentioned in our specifications; it is, therefore, somewhat startling to be told that these qualifications are really not necessary, it being quite possible to make first-class mortar and concrete by the use of even the finest sand, and that clay, rather than being a drawback is, in certain proportions a distinct benefit. If some careful tests carried out by Mr. Hain during a series of years teach us anything, however, it is that we can materially modify our views with regard to the undesirability of using either a very fine-grained sand, or one that contains a considerable percentage of clay, without

running any risk of obtaining a mortar inferior in any way to one made with sand that is regarded as orthodox.

The reason for making the tests referred to was that in the construction of some large concrete work on the Chicago, Milwaukee and St. Paul Railway a great quantity of sand was required, and it could be procured from various sources over the entire system of 7,000 miles; but the question was to decide which of the various pits belonging to the company supplied the most suitable material with the least haulage. This led to laboratory tests of questionable sands. A full account of the tests is given in a paper read by Mr. Hain before the National Association of Cement-Users at Indianapolis. A mixture of 1 part cement to 3 of sand was used throughout, and each of the tensile tests recorded in the paper represents the average of three briquettes, except in cases where one test appeared exceptionally irregular, in which case it was discarded. The tests have extended over three years, and are still being carried out.

Clay Heterodoxies.

The conclusion arrived at by Mr. Hain is that clay in limited quantities, say not more than 12 per cent., is beneficial in sand if thoroughly distributed throughout the mass; but before using the sand should be compared with an established standard. He also thinks that washed sand may sometimes be less desirable than unwashed, because

washing is apt to remove the fine grains which are required to fill up the voids; and the only safe way to decide this point is to test the sand under both conditions. A fine sand may show up well if the grains are properly graded, and a coarse sand may show up badly if it contains too few fine particles to fill the voids. The best graded sand is one in which the grains are held on a uniform series of sieves, so arranged that the voids in one lot are filled (but not over-filled) by the grains in the next smaller size, and so on.

To sum up briefly, the best mortar sand found in nature is one with sharp corners, rough surfaces, with grains neither all coarse, all medium nor all fine, but with the proper mixture of these sized particles. The sand also need not be washed, but may contain up to 12 per cent of clay, which is more likely to improve than injure it.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Wooden Pegs for Fixing Tiles.

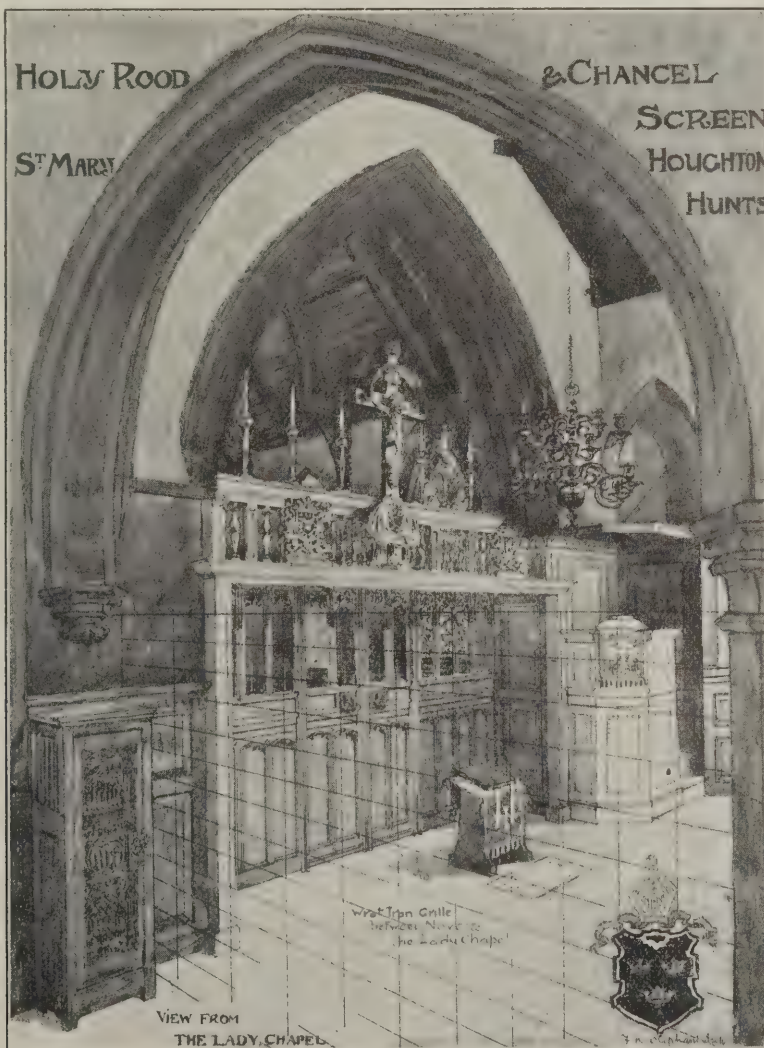
BROMLEY.—W. H. S. writes: "I am advised to use some hand-made Kentish plain roofing tiles on a house about to be erected. I have had no experience of new wooden pegs for fixing the same, but understand that pegs last about ten times as long as nails. Square deal pegs are recommended, two to each tile, which is without nibs; do you consider pegs as described the best for the purpose; if not, what would you recommend?"

Oak pegs should be used.

Testing Sewage Effluents.

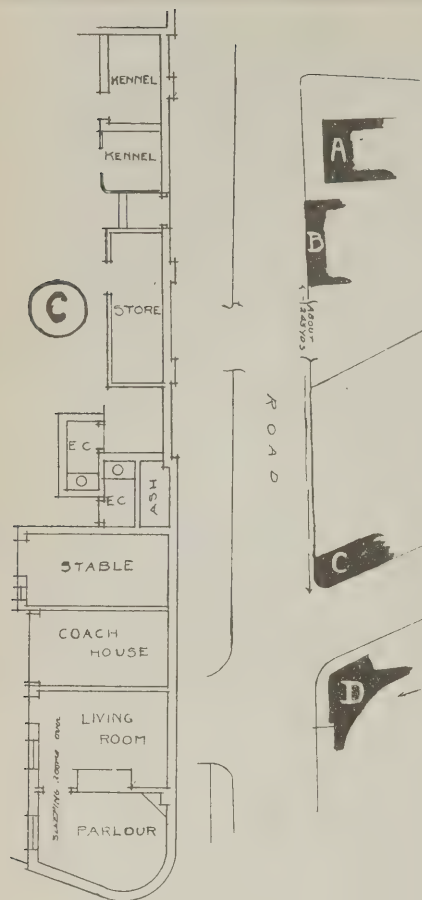
MOFFAT.—ANXIOUS writes: "Please give a simple test for roughly judging the quality of the filtered effluent from a sewage works."

The old-fashioned test of tasting—just tasting—the effluent is going out of fashion, as it is a somewhat unpleasant one. Examination should be made of the transparency and colour—at least 5 ins. or 6 ins. of water should be looked through. Then test for odour by putting some of the effluent in a bottle; shake violently, and on removal of the stopper, smell immediately. An earthy smell, resembling newly-turned mould, may usually be taken as satisfactory. Another test for average conditions may be made by getting a number of clear glass stoppered bottles of equal size, taking a sample each day and keeping each sample for a week. Any tendency to secondary decomposition can then be noted—a green dirty scum is evidence of this. The samples should be daily inspected. The most absolute test is to keep goldfish in a glass bowl, using only the effluent as the water supply. Draw off each morning by means of a syphon the greater part of the water, replacing with an equal quantity of the day's sample, which has been well shaken. If the fish live, and show no sign of distress, the effluent is satisfactory. The gold fish require feeding. We would recommend you to purchase "Simple Methods of Testing Sewage Effluents for Works Managers, Surveyors, &c.," by George Thudichum, F.I.C., 2s. 6d. nett, post free from these offices. This gives various other particulars about averaging samples, &c., of which you should be informed.



REV. F. K. OLIPHANT, ARCHITECT. (Royal Academy Exhibition, 1905.)

This screen has been designed and executed with the extreme simplicity suitable to a small parish church. It is deeply recessed and panelled at sides, and, with a wide rood loft over, the result is effective. Upon the rood loft stands the holy rood, with figures of St. Mary and St. John to be added. Behind the rood are the six rood lights. The work has been executed in oak by Messrs. Skeeler Brothers, of St. Ives. The carving is by Messrs. Thompson & Son, of Alconbury, and the metal-work by Mr. Jude, of St. Ives: from designs by the Rev. F. K. Oliphant, Rector of Houghton.



Street Frontages.

MOSELEY.—X. writes: "The accompanying plan shows some premises proposed to be erected near here. This plan has been submitted to the local authority and disapproved, the surveyor asking that the building shall be set back 9ft. instead of remaining flush as shown [Public Health Act (Buildings in Streets), 1888]. The surveyor contends that the buildings B and C are not in accordance with the Act. This is entirely contrary to what I have always understood. A is a house 9ft. back from the street; B is a coach-house flush with the street; C is flush with the street (see detailed plan); D is a shop the main wall of which is 9ft. back from the street. I shall be glad to have your opinion on this matter and, if I am right in my contention, as to the best course of procedure."

Your question is not quite clearly stated, but I will assume that A and D are existing buildings (and not new ones which you now propose to erect), and that your query refers only to the passing of plans for buildings marked B and C on your sketch plan. The correct frontage line for these new buildings will then be formed by a line drawn from the front wall of A to the front wall of D—this being, I suppose, practically equivalent to the 9ft. the council's surveyor asks for. Section 155 of the Public Health Act, 1875, runs: "An urban authority may prescribe the line in which any house or building or the front thereof shall be erected." Section 3 of the Public Health Act, 1888, enacts "it shall not be lawful in any urban district without the written consent of the urban authority to erect or bring forward any house or building in any street or any part of such house or building beyond the front main wall of the house or building on either side thereof in the same street, nor to build any addition to any house or building beyond the front main wall of the house or building on either side of the same." The Act provides for a penalty of not exceeding forty shillings per day after notice is given.

F. S. I.

White Stucco.

CHELMSFORD.—E. W. H. writes: "Please state the proportions for a good white stucco for external work, so that the colour will last. I have tried several kinds, but they have lost colour after a short time."

See a reply to an enquiry on this subject on p. 440 of your issue for January 9th, 1901.

Earth-closets.

RUSTIC writes: "(1) What is the address of Moule's Earth-Closet Co.? (2) Who are the makers of an earth-closet which has a separate receptacle for the soil and the urine? (3) What is the manurial value of the soil and ashes, &c., taken from an earth-closet? How should it be applied to the garden; and, generally, how is an earth-closet managed?"

(1) The address of Moule's Patent Earth-Closet Co., Ltd., is 5A, Garrick Street, W.C., and Brownlow Mews, W.C. (2) Mr. J. Donkin, 4, Albert Road, Bournemouth. (3) The earth-closet refuse has no manurial value in a fresh condition. The dangerous organic matters must first be resolved into simple harmless constituents by the action of bacteria in the soil; and by other bacteria these harmless constituents are built up into nitrates and nitrites, which form the food of plants. Until these bacteriological processes are effected no manurial benefit accrues to the soil. So the closet refuse should be buried in the ground and left for a time—say three months before disturbance. The most suitable method is to have a long shallow trench prepared (not more than 18ins. deep) and to empty the pail contents into it; covering each deposit with some of the excavated soil until the trench is filled, when another trench must be prepared. In emptying the pail contents see that the refuse is not left in a heap, but spread a little along the trench; otherwise the bacteria will take an unconscionable time to work through the mass. After the necessary time has elapsed the soil where the trench existed should be turned over and a crop planted. The first crop on such ground must not be a root crop. In the manner described the whole of the garden or, at any rate, the kitchen garden will gradually be utilized for the trenches, and thus the soil will be manured. But a good deal depends on the size of the garden. The soil takes times to digest the strong organic matters offered it, and the application of the refuse must not be done too often. How frequently an earth-closet should be emptied is a matter of opinion. Once a week is often reckoned sufficient; but more often the pail is emptied when it is full—and how long this takes depends on the number of people using the closet. It is better to have the pail emptied daily, and it will be found less troublesome to remove.

Cement Floors.

DORSET.—INTERESTED writes: "(1) Why is it that a cement floor which has been laid more than five months wears up every time it is scrubbed, or when a stiff broom is used for cleaning, after the floor is washed with hot water? The floor was put down to the following specification:—'Pave the floors with cement granite concrete 2ins. thick, composed of 1 part of the best London Portland cement to 2 parts granite, on a 6in. bed of broken stone or flint.' (2) Will it be necessary to break up the floor and relay? (3) The cement used is of a good bluish-grey colour. I have roughly tested it with the flask test, and by putting it under water on a piece of slate for twenty-four hours. These tests it bore excellently. Do you consider it should be analysed?"

It is not unusual to find persons blaming the cement for any trouble that may occur in concrete work, when they never think of

investigating the aggregate, the water used, or conditions of laying. We should think the trouble in this instance has arisen from one of the following causes:—(1) That the broken granite was composed of much dust, which would make the concrete crumbly; (2) that the concrete was worked up again after it had begun to set; or (3) that the dry broken stone foundation had absorbed all the moisture, and that the work was not kept wetted with moistened sand or sawdust over it so as to get it to set hard. The floor should be relayed, and we advise an under-layer of rough concrete 4ins. thick, and 2ins. of fine granite aggregate concrete on the face. It is nonsense to talk of judging the quality of a cement by its colour.

Institution of Civil Engineers' Examinations.

STRATFORD-UPON-AVON.—P. H. writes: "Where can I obtain questions set at the students' examinations of the Institution of Civil Engineers for the past two or three years?"

Apply to the secretary of the Institution, Great George Street, Westminster.

Concrete Floors.

DUNFERMLINE writes: "Is ammonia from horse or cattle urine injurious to a concrete floor which has only been laid one week after the admission of the animals, the top surface having been broken?"

Not at all, provided the concrete had been kept moist so as to become thoroughly set. Urine has no chemical action in concrete when once set.

R.I.B.A. Final Examination.

BRADFORD-ON-AVON.—G. E. P. writes: "What books are necessary to study for the R.I.B.A. final examination? I shall make Renaissance my special subject."

See the R.I.B.A. Kalendar, price 2s. 6d. nett, from No. 9, Conduit Street, Regent Street, W.

Reinforced Concrete Lintels.

BROMLEY.—W. H. S. writes: "In reference to Prof. Adams's valuable reply about reinforced concrete lintels on p. 221 of your issue for October 18th, what proportions of Portland cement to ballast or coke-breeze is to be used to suit the formula?"

The lintels should be composed of 1 part Portland cement, 1 part sharp sand and 4 parts coke-breeze or other small clean aggregate.

HENRY ADAMS.

Partitions.

BROMLEY.—W. H. S. writes: "In a certain house all the internal walls are to be 4½ins. There are ground floor, first floor, and attics in roof. The partitions in the attics are to be stud partitions. Is it expecting too much for 4½ins. to carry the inside walls up the two storeys? They would be built in grizzlies in Portland cement mortar. The longest wall without a cross-wall or a chimney breast in it is 13ft. 6ins."

Half-brick walls are not so strong for partition walls as brick-nogged partitions, unless built of hard stock brickwork in cement.

HENRY ADAMS.

At the Parish Church of All Hallows, Whitechurch (Hants), the Bishop of Dorchester dedicated on November 5th new oak clergy seats and choir seating, which have been erected from the designs of Mr. Walter E. Hewitt, A.R.I.B.A., architect, of 22, Buckingham Street, Strand, W.C., and carried out by Messrs. H. H. Martyn & Co. of Cheltenham. The chancel screen by the same architect was put up a few years ago in memory of Queen Victoria.

THE ARCHITECTS' CONGRESS.

Subjects to be dealt with.

THE following is a list of the subjects for discussion at the Seventh International Congress of Architects which is to be held in London next year from July 16th to the 21st:—

- (1) The execution of important Government and municipal architectural work by salaried officials.
- (2) Architectural copyright and the ownership of drawings.
- (3) Steel and reinforced concrete construction: (a) The general aspect of the subject; (b) with special reference to æsthetic and hygienic considerations in the case of very high buildings.
- (4) The education of the public in architecture.
- (5) A statutory qualification for architects.
- (6) The architect-craftsman: How far should the architect receive the theoretical and practical training of a craftsman?
- (7) The planning and laying-out of streets and open spaces in cities.
- (8) Should the architect have supreme control over other artists or craftsmen in the completion of a national or public building?
- (9) The responsibilities of a Government in the conservation of national monuments.

The executive committee will be glad to receive papers on any of the above subjects for presentation to the congress.

Papers may be written in English, French or German, and each must be accompanied by an abstract of not more than 1,000 words. Papers and abstracts must reach the executive committee before April 30th, 1906.

All communications should be addressed to the secretary of the committee at 9, Conduit Street, London, W.

CO-PARTNERSHIP HOUSING.

Results and Proposals.

AT a meeting of the Co-Partnership Tenants' Housing Council held at his house in Park Lane last Wednesday, Lord Brassey said this council sought to encourage the laying-out of new housing estates so as to provide for open spaces—two gardens being allotted to each house—and for the permanent social wants of the community. The object was to promote on such estates the erection, the co-operative ownership, and the administration of houses by methods similar to those of the Tenant Co-operators, Ltd., the Ealing Tenants, Ltd., the Sevenoaks Tenants, Ltd., the Garden City Tenants, Ltd., &c., which, while avoiding the dangers that too frequently accompanied the individual ownership of housing and speculative building devoid of public spirit, harmonized the interest of tenant and investor by an equitable use of the profit arising from the increase of values and the careful use of the property. In order to attain this end the council advocated the registration of societies with limited liability in building districts to acquire undeveloped building sites and to organize as shareholders in such societies possible tenants in houses when erected on the sites acquired. The council was not a commercial body, but an educational, propagandist and advisory body. In addition to the societies already referred to, others were contemplated in Birmingham, Bournville, Berkhamsted and Manchester, while interest in the scheme prevailed elsewhere. Lord Brassey said the movement had brought together £16,000 capital and £35,000 worth of property. Mr. H. Vivian (chairman of the council) said that experience at Ealing showed that the risk of not letting was practically eliminated. Of the 100 houses there contemplated about eighty were already constructed. The society had paid the

interest on capital from the start. With regard to the Garden City Tenants, it was intended to erect about 100 houses during the next eighteen months. For future extensions these two societies would require £30,000 between them, on which 4 or 5 per cent. would be paid.

NEW LONDON BUILDINGS.

AT yesterday's meeting of the London County Council the Building Act Committee reported the following application under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics*:—

Buildings upon a site abutting upon the south-western side of Finchley Road and northern side of Lymington Road, Hampstead, on the application of J. D. Hunter, on behalf of W. F. Cave. (*Consent.*)

Shop and dwelling-house with stable and coachhouse at the rear, on low-lying land situated at the corner of Abbey Wood Road and Bostal Lane, Woolwich, on the application of E. J. Bennett, on behalf of Patterson. (*Consent.*)

Two blocks of dwellings on low-lying land situated at the corner of Webber Street and Barron's Place, Southwark, on the application of W. Hobern, on behalf of W. Sumpton. (*Consent.*)

Rebuilding of Nos. 133 and 135, Regent Street, on the further application of R. C. Harrison & Son, on behalf of the London Joint Stock Bank, Ltd. (*Consent.*)

Conservatory at the rear of No. 66, Holland Park, Kensington, to abut upon Holland Park Avenue, on the application of Stimpson & Chambers, on behalf of C. Wilkinson. (*Consent.*)

A church on a site abutting upon the southern side of Mitcham Road and eastern side of Rookstone Road, Wandsworth, on the application of Gordon & Gunton. (*Consent.*)

Buildings (public baths and washhouses) on a site abutting upon the north side of Scots Road and west side of Lime Grove, Hammersmith, on the application of J. E. Franck, on behalf of the Council of the Metropolitan Borough of Hammersmith. (*Consent.*)

One-storey shops and one-storey addition at the rear of No. 379, Bethnal Green Road, Bethnal Green, to abut upon Teesdale Street on the application of C. M. Shiner, on behalf of W. A. Balls. (*Refusal.*)

A building on the east side of Torrion Road, Lewisham, to abut upon the north side of Hazelbank Road, on the application of A. C. and R. A. Blake. (*Refusal.*)

A new iron and glass shelter at the Comedy Theatre, Pantion Street, and Oxenden Street, Haymarket, on the application of Gillow & Co., on behalf of the proprietors of the Comedy Theatre. (*Refusal.*)

Six houses with bay-windows on the west side of Vestry Road, Peckham Road, Camberwell, on the application of E. Crosse & Co., on behalf of G. Pedley. (*Refusal.*)

One-storey building at the rear of No. 37, Ladywell Road, Lewisham, to abut upon a passage out of the west side of Church Grove, Lewisham, on the application of G. Kimble, on behalf of F. Kimble. (*Consent.*)

A boundary wall at the "Hugh Myddelton" schools on the north side of Sans Walk, Finsbury, on the application of the Education Committee of the Council. (*Consent.*)

A workshop on the northern side of Richmond Terrace, Clapham Road, Kennington, westward of No. 90, Clapham Road, on the further application of J. A. J. Woodward & Sons, on behalf of C. Blatchford. (*Refusal.*)

A new street for carriage traffic to lead from Napier Avenue to Cromwell Avenue, Fulham, and in connection therewith the widening of portions of Napier Avenue and Cromwell Avenue, on the application of Cluttons on behalf of the Ecclesiastical Commissioners. (*Consent.*)

A new street for carriage traffic to lead from Gawber Street to Cyprus Street, Bethnal Green, on the application of the Council of the Metropolitan Borough of Bethnal Green. (*Consent.*)

An extension of the period within which the conditions contained in the resolution of 3rd September, 1903, sanctioning the formation or laying out of new streets on the east side of Wood Lane, Hammersmith, at the corner of North Pole Road, Hammersmith, were to be complied with on the application of Weatherall & Green. (*Refusal.*)

A deviation from the plans approved on 26th January, 1904, for the erection of a building on a site abutting on the River Thames and approached from Blackwall Lane, Greenwich, on the application of Mark Fawcett & Co. (*Consent.*)

Means of escape on the fifth (top) storey of Nos. 22 and 23, Fenchurch Street and No. 2, Rood Lane, City, on the application of E. B. Ellis, on behalf of Kleinwort, Sons, & Co. (*Consent.*)

New Docks at Seaham Harbour were formally opened on Saturday by Mr. A. J. Balfour. The works were designed by Mr. H. H. Wake, of Sunderland, and carried out under the supervision of Mr. P. W. Meik, of Westminster. The contract was let to Messrs. S. Pearson & Son, Ltd., of Westminster, for £378,000, and the work was begun in 1899. The main dock is 1,000ft. long, 450ft. wide and 27ft. 6ins. deep. The gateway is 65ft. wide, enclosed by a pair of storm gates, constructed of karri wood, weighing 90 tons each.

Law Cases.

Surveyors' Certificates.—In the Chancery Division of the High Court of Justice on Friday last, before Mr. Justice Swinfen Eady, an important case was heard in which the Wimbledon House Property Co., Ltd., were the plaintiffs and Mr. William Butt, builder, was the defendant, he having been engaged under a building contract dated March 1st, 1904, to erect two houses at Wimbledon on the plaintiff company's estate. Mr. Eve, K.C., M.P., and Mr. Horne represented the plaintiff company, and Mr. A. A. Scanlan (instructed by Messrs. Richard Davies & Sons) was counsel representing defendant. The facts were as follows:—Under his agreement for the erection of the houses the defendant had received eight advances, amounting in all to nearly £2,000, after the presentation of a certificate signed by a surveyor named Power. The latter's last certificate, dated November, 1904, was dishonoured by the plaintiff company, and hence this action arose. The building agreement stated that the work was to be carried out under the supervision of a surveyor, but at the trial it was contended for the plaintiff company that although Mr. Power had approved the specifications prepared by the builder and had, in fact, held himself out as their surveyor, Mr. Lancaster, the secretary of the company, was the surveyor appointed by the plaintiffs under the agreement. The point to which Mr. Scanlan, for the defendant, attached most importance was that payments had been made without demur on the part of the plaintiff company on the certificates given from time to time by Mr. Power, and he submitted that these certificates were final with respect to the amount due to the builder, citing the case of *Robins v. Goddard*, 1905. He argued that the plaintiffs had no power to refuse the advances after a certificate had been given by Power. The learned judge, however, held that the plaintiffs were entitled to succeed, and granted possession of the premises with the perpetual injunction asked for, holding that Mr. Power's certificates were given subject to the approval of Mr. Lancaster, who was said to be the plaintiff company's surveyor.

Teignmouth Reservoir Appeal.—On Wednesday last the Court of Appeal gave judgment in the case of the *Teignmouth Urban District Council v. Slocombe*. Defendant contracted to re-line, roof and divide a water reservoir for something under £6,000. Plaintiffs were not satisfied with his work, and the Official Referee awarded them £2,000. Against that decision defendant unsuccessfully appealed to a Divisional Court. He now appealed to the Court of Appeal.—Without calling upon counsel for the respondents, the Master of the Rolls said in his opinion the appeal failed. The Official Referee was of opinion that although alterations were assented to they did not relieve the contractor from putting down concrete to the depth originally prescribed of 12ins., nor did it justify him in putting down half-bricks instead of whole bricks. He also found that the bricks were not laid at all in the way prescribed. He found as regarded the concrete that both in quality and quantity the original obligation remained of good concrete and concrete of a certain depth, and he found that the concrete actually put in failed radically. The joint result of these failures, taken together, was that instead of having a good foundation for the concrete the plaintiffs had an imperfect foundation made up of half-bricks and rubbish, and that they had concrete of inferior quality. The consequence was a worthless reservoir instead of a sound one. He saw no ground whatever for the appeal, and considered it should be dismissed with costs. The Lords Justices concurred.

THE FACTS ABOUT WINCHESTER CATHEDRAL.

THE Dean and Chapter of Winchester Cathedral have received full and careful reports from Mr. J. B. Colson, their architectural surveyor, Mr. T. G. Jackson, R.A., and Mr. Francis Fox, the eminent engineer; and it is now possible to state exactly what are the facts about the danger threatening this great building. The mischief is most serious in the south wall of the presbytery, and is of long standing. During at least 400 years there has been from time to time a settlement of the east portion of the building, and the movement has been of late more marked. This is attributable partly to the insufficient buttressing of the vaulting, partly to the untrustworthy foundation—a bed of soft marl, only 10ft. below the surface, permanently washed by water, which in wet seasons rises some feet above it. The wall has been already securely shored, and Mr. Jackson advises that, as soon as it has been made solid by bonding and grouting, and the spread of the vaulting arrested, the buttresses should be underpinned on a solid stratum of gravel which has been found at a depth of 16ft. In other portions of the fabric there is a progressive subsidence little less alarming. The east wall of the south transept will also have to be underpinned on the gravel bed. And the vaulting at the east end of the crypt is in a dangerous condition. It is now supported by shores, and the central column must be underpinned. Unhappily this is not all. Though the danger caused by the subsidence is so urgent that it must be grappled with at once, there are other portions of the fabric which are seriously out of repair and must be taken in hand in the near future. The roof of the nave was thoroughly restored eight years ago at a cost of £13,000, but the roof of the north aisle and a part of the roof of the south aisle require re-leading, and the spires and pinnacles of the west front are in a dilapidated, if not dangerous, condition. All this is in the truest sense work not of "restoration" but of preservation. It is impossible to form at present any accurate estimate of what the cost will be. It will probably amount to £20,000, and a yet larger sum may be required. An appeal is therefore made for funds, which should be forwarded to Mr. W. M. Furneaux at the Deanery, Winchester, or to the hon. treasurer, Mr. Fred Bowker, jun., Southgate Street, Winchester.

NEW GOVERNMENT BUILDINGS IN LONDON.

LAST year the Royal College of Science at South Kensington, the first of the four great Government buildings now in course of erection, was finished, as far as the exterior was concerned, and is now nearly ready for occupation. This year the second one, the War Office in Whitehall, is completed—that is to say, the scaffolding is removed and the windows are in . . . Of the two remaining works, the most advanced is the Victoria and Albert Museum, which is built up to its full height, and is being roofed, while the small domes and towers are rising, and will be finished this year. The great central dome over the principal entrance, to be 150ft. high, is already 30ft. above the roof. The fourth of the new large Government buildings—the new offices for the Local Government Board at the bottom of Whitehall—has made such good progress during the year that the side opposite the Abbey is built up to its full height, and the towers here are rising, but in Parliament Street matters are not so advanced, the cornice not being yet reached, while the pediment and several other features of the building have still to be done.

Of the smaller works, the south block of the Admiralty facing the Horse Guards Parade is finished. The new processional road in the Mall has been brought on from the Duke of York's steps to the Admiralty, and a new road has been cut from the memorial across the Green Park to Piccadilly. At the Palace heavily-gilded gates have been placed in position, the lodge of Buckingham Gate has been rebuilt, and square columns for the carriageways and footpaths of each of the roads leading up to the central point where the statue will be placed have been erected.

The new Land Registry Office in Lincoln's Inn Fields is nearly ready for occupation. It is a large Gothic building of red brick with oriel windows and doorways of stone, and a low square tower at one end.

The following works have been commenced this year:—At Spring Gardens the ground is being cleared for the triumphal arch which is to bring the processional road into Trafalgar Square. After lying derelict for some years, the site of the old Civil Service Commission, by Westminster Bridge, is being utilized for the annexe to New Scotland Yard. It will be similar in style to the parent building—granite below and brick and stone above. It is already three-fourths built, and will be finished next year. The foundations of the Royal Medical College at Millbank, in connection with the barracks and military hospital there, are laid; also the foundation-stone of the new post-office building in Newgate Street. Nothing has been done about the extension of the British Museum, though the site for it was cleared two years ago.—[Extracts from the "Globe."]

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending November 10th thirty failures in the building and timber trades in England and Wales were gazetted.

- W. SAMPSON, builder, Watford. R.O. Oct. 31st.
C. G. TOWSEND, builder, Deal. Adj. Oct. 28th.
H. S. ROBERTS, architect, Rhyl. R.O. Nov. 3rd.
B. J. BATES, builder, Hedge End. R.O. Nov. 3rd.
J. WELHAM, builder, Lowestoft. Deficiency £1,775.
H. EVANS & SON, builders and contractors, St. Albans. Deficiency £484.
E. CORNER, builder and contractor, Bridlington. R.O. Nov. 3rd.
J. A. CRAIG, builders' material merchant, Southend. Liabilities £1,667; estimated assets £560.
G. W. GREGORY, builder, Sutton-in-Ashfield. Deficiency £400.
J. T. BROWN, builder, Nottingham. Liabilities £662; assets £382.
M. MORLEY, architect and surveyor, Wellington. Deficiency £900.
C. C. CROWE, timber and builders' material merchant, Tottenham and Kensal Rise. Adj. Nov. 2nd.
A. G. DEANE, builder and decorator, Reading. R.O. Oct. 31st.
A. L. GENLLOND, architect, Cherryhinton. P.E., Cambridge Guildhall, Nov. 15th, at 11.
J. A. McKAY, plumber, Sunderland. First meeting, O.R.'s, Sunderland, Nov. 15th, at 3.30. P.E., Sunderland, Nov. 16th, at 11.15.
H. PALMER, plumber, Southsea. First meeting, O.R.'s, Portsmouth, Nov. 16th, at 3. P.E., Portsmouth C.C., Nov. 27th, at 11.
E. SMITH, contractor, Edenbridge. First meeting, Swan Hotel, Tunbridge Wells, Nov. 16th, at 2.30. P.E., Tunbridge Town Hall, Dec. 4th, at 12.
TIMSON & ADAMS, builders' merchant and contractors, Leicester. First meeting, O.R.'s, Leicester, Nov. 24th, at 12. P.E., The Castle, Leicester, Dec. 1st, at 13.
T. F. CHARLES, builder and contractor, Waddingham. First meeting, O.R.'s, Lincoln, Nov. 16th, at 11.30. P.E., Sessions House, Lincoln, Nov. 30th, at 3.
A. W. FOX, painter and plumber, Great Yarmouth. First meeting, O.R.'s, Norwich, Nov. 15th, at 12.30. P.E., Great Yarmouth Town Hall, Dec. 1st, at 10.
BROWN BROTHERS, builders' merchants, Salisbury. First meeting, Bankruptcy Court, London, Nov. 17th, at 12. P.E., Council House, Salisbury, Dec. 14th, at 2.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	per qr.	1	11	0	1	13	0
Clover, best	per load	3	12	0	4	0	0
Hay, good	do.	3	5	0	3	10	0
Sainfoin mixture	do.	3	7	0	3	15	0
Straw	do.	1	10	0	1	16	0

OILS AND PAINTS.

Castor Oil, French	per cwt.	1	1	10	1	2	15
Colza Oil, English	do.	1	4	6	—	—	—
Copperas	per ton	2	0	0	—	—	—
Lard Oil	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbamate	per ton	16	0	0	—	—	—
Do. red	do.	15	0	0	0	19	0
Linseed Oil, barrels	per cwt.	0	17	7½	—	—	—
Petroleum, American	per gal.	0	0	7½	0	0	7½
Do. Russian	do.	0	0	6½	0	0	6½
Pitch	per barrel	0	8	0	—	—	—
Shellac, orange	per cwt.	8	15	0	—	—	—
Soda, crystals	per ton	3	2	6	3	5	0
Tallow, Town	per cwt.	1	6	9	1	7	6
Tar, Stockholm	per barrel	1	5	0	—	—	—
Turpentine	per cwt.	2	9	4½	—	—	—

METALS.

Copper, sheet, strong	per ton	86	0	0	—	—	—
Iron, Staffs, bar	do.	6	15	0	8	10	0
Do. Galvanized Corrugated sheet	do.	11	15	0	12	5	0
Lead, pig, Soft Foreign	do.	15	5	0	—	—	—
Do. do. English common brands	do.	15	10	0	—	—	—
Do. sheet English, 3lb. persq. ft. and upwards	do.	17	0	0	—	—	—
Do. pipe	do.	17	10	0	—	—	—
Nails, cut clasp, 3in. to 6in.	do.	9	5	0	—	—	—
Do. floor brads	do.	9	0	0	—	—	—
Steel, Staffs, Girders and Angles	do.	6	15	0	7	5	0
Do. do. Mild bars	do.	7	5	0	7	10	0
Do. do. Foreign	do.	150	12	6	151	2	6
Do. English ingots	do.	153	10	0	154	10	0
Do. zinc, sheets, Silesian	do.	31	7	6	—	—	—
Do. do. Vieille Montaigne	do.	31	10	0	—	—	—
Do. Spelter	do.	28	10	0	28	12	6

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel	per load	2	15	0	5	0	0
Pine, Quebec, Yellow	do.	4	2	6	7	10	0
Do. Pitch, American	do.	3	1	0	5	0	0
Do. Laths, log, Dantzic	per cu. fath.	4	0	0	6	0	0
Deals, Gothenburg, Yellow, 4th, 4x11	per std.	9	0	0	—	—	—
Do. do. do. 5th, 4x11	do.	8	10	0	—	—	—
Do. do. do. Montreal, Superior Dry Pine, 4th, 3x11	do.	9	15	0	10	0	0
Do. do. do. do. 4th, 3x11	do.	9	15	0	—	—	—
Do. Mobile Pitch-pine, 3x9	do.	9	0	0	—	—	—
Do. Fiume, White, 1st, 3x9	do.	8	10	0	—	—	—
Do. Kem Yellow, 2nd, 3x9	do.	15	0	0	—	—	—
Do. Petschora, Dry Yellow, 2nd, 3x9	do.	14	5	0	—	—	—
Do. do. do. do. 3rd, 3x9	do.	10	5	0	10	10	0
Do. Riga, White, Unsorted, 3x9	do.	8	10	0	—	—	—
Do. do. do. do. 2½x7	do.	7	10	0	—	—	—
Do. Galatz, White, 1st, 3x9	do.	7	5	0	—	—	—
Do. Archangel, Dry, White, 2nd, 3x9	do.	10	0	0	10	5	0
Do. Mesane, Dry, Yellow, 3rd, 3x9	do.	10	5	0	—	—	—
Do. Norrsundet, Yellow, 3rd, 3x8	do.	10	0	0	—	—	—
Do. Gamleby, Yellow, Unsorted, 3x4½	do.	7	0	0	—	—	—
Do. Sandarne, Yellow, 4th, 2½x7	do.	9	5	0	—	—	—
Battens, all kinds	do.	6	15	0	13	0	0
Flooring Boards rin. prepared, 1st	persquare	0	10	0	0	14	0
Do. 2nd	do.	0	9	0	0	10	0
Do. 3rd, &c.	do.	0	7	3	0	8	9

HARD WOODS.

Ash, Quebec	per load	3	15	0	7	10	0
Birch, New Brunswick	do.	2	5	0	4	10	0
Do. Quebec do.	do.	2	10	0	4	15	0
Box, Turkey	per ton	7	0	0	20	0	0
Cedar, Cuba	per ft. sup.	0	0	3	6	0	4
Do. Honduras	do.	0	0	5	—	—	—
Do. Tobasco	do.	0	0	5	—	—	—
Elm, Quebec	per load	4	0	0	8	5	0
Jarrah, plank	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0	0	4½	0	0	5½
Do. Tobasco	do.	0	0	3½	0	0	6
Do. Cuba	do.	0	0	3½	—	—	—
Do. African	do.	0	0	3½	0	0	4½
Oak, Wainscot	per log.	3	10	0	7	5	0
Teak, Indian, logs	per load	9	5	0	19	0	0
Do. do. planks	do.	12	15	0	20	0	0
Whitewood, American, logs	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards	do.	0	1	3	0	3	0

Coming Events.

Wednesday, November 15.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—Excursion to Dawdon Colliery.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. A. Morrison on "Improvements in Plumbing and Sanitary Works," at 8 p.m.

Thursday, November 16.

CARPENTERS' COMPANY.—Mr. James Bartlett on "Setting-out Work for Acts of Parliament and By-laws," Carpenters' Hall, London Wall, at 7.30 p.m.
SOCIETY OF ARCHITECTS.—First Ordinary General Meeting at 8 p.m.

Friday, November 17.

INSTITUTION OF MECHANICAL ENGINEERS.—Meeting at 8 p.m.
BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. R. Catterson-Smith on "Ornamental Design and how it should be taught," at 6.45 p.m.
ARCHITECTURAL ASSOCIATION.—Mr. J. A. Gotch on "Old Manor Houses," at 7.30 p.m.

Saturday, November 18.

JUNIOR INSTITUTION OF ENGINEERS.—Visit to Messrs. Barclay, Perkins & Co.'s Anchor brewery, Park Street, Southwark Bridge, at 2.30 p.m.

Monday, November 20.

SURVEYORS' INSTITUTION.—Junior Meeting at 7 p.m.
ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. R. A. Denell on "American Methods of Erecting Buildings," at 8 p.m.

Tuesday, November 21.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—Mr. E. Gunn on "The Southern Border Towns of Suffolk," at 7.30 p.m.

Wednesday, November 22.

NORTHERN ARCHITECTURAL ASSOCIATION.—Opening Meeting of Session at 7.30 p.m.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. J. A. Morris on "A Scottish Town," at 8 p.m.

Thursday, November 23.

BUILDERS' BENEVOLENT INSTITUTION.—Fifty-eighth Annual Dinner, Hotel Metropole, at 7 p.m.

Monday, November 27.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

Tuesday, November 28.

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. R. W. Orme on "Italian Renaissance," at 6.30 p.m.

Wednesday, November 29.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. T. Haddon on "A Practical Demonstration of Wrought-Iron Work," at 8 p.m.

Friday, December 1.

ARCHITECTURAL ASSOCIATION.—Mr. E. F. Reynolds on "Turkish Architecture," at 7.30 p.m.
BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. J. Starkie Gardner on "Metal Applied as External Decoration to Buildings," at 6.45 p.m.

Monday, December 4.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. E. A. Rickards on "Intention in Ornament."

Tuesday, December 5.

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. J. H. Gibbons on "Some Hints on the Sketching of Churches," at 6.30 p.m.

Tuesday, December 6.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. E. Macrae on "A Tour in Belgium," at 8 p.m.

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Barry.—Accepted for the erection of a small-pox hospital, for the Public Works Committee:—
H. S. Rendle, Barry £4,554

Bournemouth.—Accepted for the erection of shelters and retaining walls, &c., near Bournemouth Pier, for the Town Council. Mr. F. W. Lacey, M.I.C.E., borough engineer:—
McWilliam & Son, West Station Works, Bournemouth £3,860

Clatterbridge.—For the erection and completion of infirmary, nurses' home, receiving wards, laundry, &c., at the workhouse, for the Guardians of Wirral Union. Messrs. John H. Davies & Sons, architects, Chester:—
G. Roberts & Brother, Llandudno £10,086 0 0
G. Ellidge, Birkenhead 9,776 15 0
H. Sumpter, Chester 9,380 0 0
Brown & Backhouse, Liverpool ... 9,324 0 0
D. Davis, Cardiff 9,317 0 0
Waring-White Building Co., Liverpool 9,257 9 0
J. Thomas & Sons, Birkenhead ... 9,247 0 0
J. Hopley, Little Sutton, Chester ... 9,210 18 5
R. Allen, Birkenhead 9,206 0 0
P. Rothwell, Birkenhead 9,128 10 0
W. Moss & Sons, Loughborough ... 9,097 7 2
L. Jones, Wolverhampton 9,040 5 0
W. Flemming & Co., Neston 9,019 4 3
W. Williams, Hoole, Chester 9,012 11 10
S. Webster, Bootle, Liverpool 8,991 0 0
J. Merritt, Birkenhead 8,971 10 0
J. E. Gabutt, Birkenhead 8,860 0 0
J. Mayers & Son, Chester 8,815 15 0
W. H. Ford, Birkenhead 8,752 16 6
Hughes & Stirling, Liverpool 8,700 0 0
A. White & Sons, Liverpool 8,700 0 0
F. Matthews, Nantwich 8,652 5 2
J. Bellis, Liscard 8,595 0 0
Gerrard & Sons, Swinton, Manchester 8,555 0 0
T. Huxley, Malpas, Cheshire 8,555 0 0
Dryland & Preston, Littleborough 8,250 0 0

* Accepted.

Crook (Durham).—For the whole of the work required in extensions to the Co-operative Store, Crook, and stables, loose-boxes, &c., for nineteen horses. Mr. F. H. Livesay, architect, 107, Newgate Street, Bishop Auckland:—
Davison & Bolam, Blaydon-on-Tyne £2,817 0 0
W. Lister 2,717 0 0
H. C. Howe, West Hartlepool 2,685 3 8
G. C. Young, Stanley, Crook 2,632 2 0
P. C. Scott, Darlington 2,628 14 0
W. Walton 2,560 0 0
G. Lax 2,557 0 0
W. Matchell 2,547 0 0
J. Kyle & Son, Barnard Castle 2,540 0 0
R. Wilson, Barnard Castle 2,500 2 11
T. Atkinson, Coundon 2,497 0 0
T. Walton 2,449 16 6
Wright & Freeman, Welbeck Road, Byker, Newcastle-on-Tyne 2,176 10 0

* Accepted. [Rest of Crook.]

Hampton.—For the erection of a new public elementary school for 800 children, for the Middlesex Education Committee. Mr. G. E. T. Lawrence, architect, Buckingham Street, Adelphi, W.C.:—
J. Barker & Co. £12,112
J. Ward & Son 11,931
Goddard & Sons 11,829
T. J. Messom & Sons 11,675
T. H. Kinglerlee 11,229
G. Godson & Sons 10,944
F. G. Minter 10,757
Patman and Fotheringham 10,728
Wisdom Brothers 10,609
Fassnidge & Sons 19,518
D. D. Neale 10,439
C. F. Dickens 10,385
W. J. Dickens 10,294
A. & B. Hanson 10,253

J. Dorey & Co. £10,192
Fairhead & Son 10,106
H. Knight & Son 9,432

Henbury.—For the erection of a new police-station and petty sessional court at Henbury, near Bristol. Mr. R. Phillips, county surveyor, Gloucester:—

A.—Police station.		B.—Petty sessional court.	
E. Browning	£3,008 10 0	... ..	£1,557 0 0
F. A. R. Woodward	2,800 0 0	... ..	1,500 0 0
J. Hatherley	2,680 0 0	... ..	1,490 0 0
Stephens, Bastow & Co.	2,692 0 0	... ..	1,463 0 0
Orchard & Pier, Stroud	2,531 0 0	... ..	1,380 0 0
E. Love	2,530 0 0	... ..	1,400 0 0
H. A. Forse & Son	2,500 0 0	... ..	1,430 0 0
A. G. Heard	2,518 7 1	... ..	1,380 13 1
J. Perkins & Son	2,396 0 0	... ..	1,310 0 0
Adams & Jefferies	2,356 0 0	... ..	1,336 0 0
E. Walters & Son	2,317 0 0	... ..	1,257 0 0
R. Wilkins & Sons	2,277 0 0	... ..	1,269 0 0
W. Jones, Gloucester	2,280 0 0	... ..	1,260 0 0
T. Lovell & Sons	2,241 0 0	... ..	1,208 0 0
A. J. Colborne, * Swindon	2,176 13 6	... ..	1,190 16 6

* Accepted. [Rest of Bristol.]
Kirkcaldy.—Accepted for the erection of business premises in High Street, Kirkcaldy, for the Pathhead and Sinclairtown Reform Co-operative Society, Ltd. Mr. D. Forbes Smith, A.R.I.B.A., architect, Kirkcaldy. Quantities by the architect:—

D. Wilkie, Sinclairtown	£2,929 0 0
Joiner.	
J. Monro, Kirkcaldy	1,999 9 3
Plumber.	
A. Thomson, Dunfermline	250 0 0
Ironwork.	
W. L. Mitchell, Kirkcaldy	790 0 0
Tiler.	
R. Ryrie, Edinburgh	23 19 3
Glazier.	
J. Haxton & Co., Kirkcaldy	146 18 9
Slater.	
Currie & Cant	0 10 0

[Total, exclusive of electric hoists, shop fittings, electric lighting and heating, £6,450 17s. 3d.]

Llandrindod Wells.—For the erection of Baptist chapel, &c., in High Street, for the Trustees; and bank premises, &c., in Temple Square, for Mr. T. A. Jones, Tudor House, Middleton Street. Mr. E. Peters Morris, architect, Llandrindod Wells:—

Lloyd Brothers, Swansea	£2,954 11 6
J. Dallow & Sons, Birmingham	2,650 0 0
R. E. Davies	2,340 0 0
S. A. Bound	2,200 0 0
E. H. Williams	2,195 0 0
H. Smith, Wolverley	2,130 0 0
D. Meredith	1,963 0 0
G. Bullock, * Abbey Mills, Shrewsbury	1,897 0 0
A. Holmes, Wellington	1,300 0 0

* Accepted. [Rest of Llandrindod Wells.]
London, S.W.—For the Admiralty extension, Block IV, (substructure), for the Commissioners of H.M. Works and Public Buildings:—

Muirhead, Greig & Matthews	£37,860 17 9
H. Willcock & Co.	36,775 0 0
D. R. Paterson	36,400 3 2
Johnson & Co.	36,369 0 0
J. & M. Patrick	36,900 0 0
Martin, Wells & Co.	33,012 0 0
Perry & Co.	33,012 0 0
J. Allen & Sons	30,975 0 0
Patman & Fotheringham	30,893 0 0
Holliday & Greenwood	30,777 0 0
J. Smith & Sons	29,773 0 0
Higgs & Hill	29,840 0 0
B. E. Nightingale	29,470 0 0
Foster & Dicksee	29,467 0 0
T. H. Kinglerlee & Sons	29,319 0 0
J. E. Johnson & Son	29,360 0 0
N. Fortescue & Sons	28,855 0 0
E. Lawrence & Sons	28,832 0 0
Holloway Brothers	28,600 0 0
Leslie & Co.	28,170 0 0
C. Wall, Ltd.	27,677 0 0
W. Patinson & Sons	27,543 0 0
H. Lovatt, Ltd.	27,000 0 0
J. Mowlem & Co.	26,485 0 0
A. Hudson & Co.	25,550 0 0

(Continued on p. xvii.)

New Companies.

TYNTE BUILDING CO., builders and contractors, &c., Abercynon. Capital: £1,000.

CHELTEMHAM LAND CO., builders, decorators, &c., Stafford. Capital: £5,000.

C. J. NEVITT, LTD., builders, contractors, &c., Stafford. Capital: £12,000.

YARMOUTH AND GORLESTON INVESTMENT AND BUILDING CO., LTD. Capital: £5,000.

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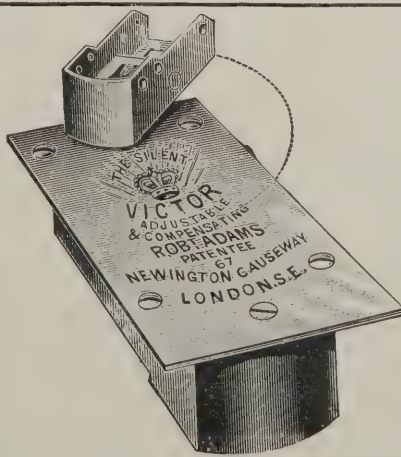
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Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

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THE QUANTITY SURVEYORS' ASSOCIATION.

(INCORPORATED.)

A PRELIMINARY EXAMINATION for the admission of Students of the above Association, and a DIRECT FINAL EXAMINATION qualifying for Membership, will be held in APRIL 1906.

Applicants must send in their names for approval by the Council on Forms which (together with the Syllabus) may be obtained from the undersigned, on or before the 30th day of NOVEMBER, 1905.

F. B. HOLLIS, Hon. Sec.,
October, 1905, 17, Bedford Row, London, W.C.

THE ARCHITECTURAL ASSOCIATION.

November 17th. Ordinary General Meeting at 18, Tufton Street, Westminster, S.W., at 7.30 p.m. Paper by Mr. J. A. Gatch on "Old Manor Houses" (illustrated with lantern views).

HENRY TANNER, JR., } Hon. Secs.
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Forms of Tender and Conditions of Contract can be obtained on application at the undermentioned office, by letter or in person, between the hours of 10 and 4 o'clock. The TENDERS are due by NOON, on WEDNESDAY, the 22nd NOVEMBER.

War Office, Pall Mall, S.W.,
November, 1905.

TENDERS ARE INVITED for the ERECTION OF FOUR DETACHED HOUSES and ONE BUNGALOW, at Sandsend, Yorkshire. Plans and Specification can be seen, and Bills of Quantities and Form of Tender obtained on payment of £1 rs., which will be returned on receipt of a bona-fide Tender.

Tenders are to be delivered on or before NOVEMBER 17th, 1905. THOS. DOWSON,
Sandsend. Architect and Surveyor.

BOROUGH OF BROMLEY.

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Bills of quantities and form of Tender will be furnished on application being made to me not later than the 7th of November next, accompanied by a £5 Bank of England Note, which will be returned on the receipt of a bona-fide Tender.

Tenders, endorsed "Tender for Municipal Buildings," to be delivered to me as under not later than MONDAY, the 27th day of NOVEMBER, 1905.

The Council does not bind itself to accept the lowest or any Tender.

Municipal Offices, FRED H. NORMAN,
Bromley, Kent, Town Clerk.
27th October, 1905.

GLOUCESTER EDUCATION COMMITTEE.

TO BUILDERS AND CONTRACTORS.

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Sealed Tenders are to be sent in to the undersigned not later than NOON on TUESDAY, NOVEMBER the 21st next, endorsed "Tender for Derby Road Council Schools, Gloucester."

The Committee do not bind themselves to accept the lowest or any Tender. P. BARRETT COOKE, Sec.,
5, Berkeley Street, City of Gloucester Education Committee,
Gloucester.

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The only condition we make is that immediately an appointment is obtained we are advised in order that we may take the number and name off the Register, thus saving waste of space.

All advertisements for next week must reach this office not later than 5 o'clock on Monday, the 20th inst.

The Employment Register in this number appears on page xx.

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" 16	Aberdeen—Shop, &c.	Northern Co-operative Co.	R. G. Wilson, Architect, 181A Union Street, Aberdeen.
" 16	Southend-on-Sea—Lavatories, &c.	Corporation	E. J. Elford, Borough Engineer, Southend-on-Sea.
" 17	Canterbury—Post-office	H.M. Office of Works	Secretary, H.M. Office of Works, Storey's Gate, London, S.W.
" 17	St. Albans—Sorting-office	H.M. Office of Works	Postmaster, St. Albans.
" 17	Grays—Alterations and Additions to School	Governors	T. A. Capron, Clerk, 2 Orsett Road, Grays.
" 18	Grimsby—Church	Corporation	E. Goodhand, Architect, Osborne Chambers, Grimsby.
" 20	Preston—Convenience, &c.	Education Committee	Borough Surveyor, Town Hall, Preston.
" 20	Blackpool—Schools	Corporation	J. S. Brodie, Borough Surveyor, Town Hall, Blackpool.
" 20	Belfast—Flooring	Committee	A. Brumwell Thomas, Architect, 5 Queen Anne's Gate, Westminster.
" 21	Sligo—Re-laying Flooring	Education Committee	Resident Medical Superintendent, Sligo District Lunatic Asylum.
" 21	Gloucester—School	Guardians	J. Fletcher Trew, Architect, County Chambers, Station Rd., Gloucester.
" 21	King's Lynn—Alterations at Workhouse	H.M. Office of Works	Jarvis & Son, Architects, Lynn.
" 21	Swindon—County Court	Urban District Council	Registrar, County Court, Swindon.
" 22	Carlton—Fire-station	Managers	J. C. Haller, Engineer and Surveyor, Carlton, Nottingham.
" 23	Ashford—Screen	Education Committee	F. G. Beeching, Clerk, Ashford, Middlesex.
" 23	Queen's Ferry—School	Tramways Committee	S. Evans, Architect, County Offices, Mold, Flint.
" 23	Mirfield—Warehouse	Hackney Council	J. Kirk & Sons, Architects, Huddersfield.
" 23	Sheffield—New Roofing, &c.	Education Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
" 23	London, N.E.—Convenience	Co-operative Society, Ltd.	Norman Scorgie, Borough Engineer, Town Hall, Hackney, N.E.
" 24	Belvedere—School	Guardians	W. Egerton, Architect, 12 Queen's Road, Erith.
" 24	Holyhead—Business Premises	Tramways Committee	H. Thomas, Architect Castle Buildings, Carnarvon.
" 24	East Preston—Infirmary, &c.	Town Council	Guardians Office, East Preston.
" 27	Salford—Offices, &c.	H.M. Office of Works	General Manager, Tramways Department, Salford.
" 27	Bromley—Municipal Buildings	Borough Council	R. F. Atkinson, Architect, 8 Sackville Street, W.
" 28	Reading—Enlargement of Sorting-office	County Council	H.M. Office of Works, Storey's Gate, London, S.W.
" 28	Kensington—Working Men's Flats	Market Cafe Co., Ltd.	W. Chambers Leete, Town Clerk, Town Hall, Kensington.
" 28	London, E.—Car Shed	Town Council	Highways Section, Architect's Department, 13 Charing Cross, S.W.
" 28	Holyhead—Business Premises	Guardians	J. Owen, Architect, Exchange Chambers, Holyhead.
" 29	South Shields—Baths and Washhouses	Managers	J. H. Morton, Architect, 50 King Street, South Shields.
" 30	Styal—Homes	Education Committee	J. W. Beaumont & Son, Architect, 10 St. James's Square, Manchester.
" 30	Uffington—Alterations to School	Education Committee	G. Cossor, Post Office, Uffington.
" 30	Bournemouth—Schools	Education Committee	Borough Engineer, Bournemouth.
" 30	St. Austell—Alterations to Chapel	Education Committee	J. Mutton, Architect, Charlestown, St. Austell.
Dec. 1	Heacham—Schools, &c.	Education Committee	H. J. Green, Architect, Castle Meadow, Norwich.
" 1	St. Albans—School	Education Committee	U. D. Smith, County Surveyor's Offices, Hatfield.
" 1	Therford—Enlargement of School	Education Committee	A. F. Scott, Architect, Castle Meadow, Norwich.
" 1	Burgh-next-Aylsham—School	Committee of Management	A. F. Scott, Architect, Castle Meadow, Norwich.
" 1	Limavady—Hall	H.M. Office of Works	D. Conroy, Architect, 21 Shipquay Street, Londonderry.
" 5	Guston, Dover—Duke of York's Military School	H.M. Office of Works	H.M. Office of Works, Storey's Gate, London, S.W.
" 6	Hull—Superstructure of New Post-office	Education Committee	H.M. Office of Works, Storey's Gate, London, S.W.
" 6	Braintree—Partitions, &c.	Education Committee	F. Whitmore, Architect, Duke Street, Chelmsford.
" 8	Pinged—Conveniences, Boundary Walls, &c.	Education Committee	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
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" 8	Duckmanton—Huts		Brodrworth Main Colliery Co., Duckmanton, Chesterfield.
ENGINEERING:			
Nov. 16	London, W.—Bridge	Middlesex County Council	H. T. Wakelam, Engineer, Middlesex Guildhall, Westminster, S.W.
" 16	Greenwich—Boiler	Guardians	Clerk's Office, Workhouse, East Greenwich.
" 16	Leyton—Engines, &c.	Urban District Council	F. Harman Lewis, Engineer, Electric Light Works, Leytonstone.
" 18	Bradford—Heating	Royal Infirmary	F. Holland, Engineer, 11 Parkinson's Chambers, Hustlergate, Bradford.
" 20	Belfast—Morton Pumps, &c.	Improvement Committee	City Surveyor's Office, Belfast.
" 20	Kington—Reservoir	Guardians	C. Stuart Delfasse, 8 Duke Street, Kington.
" 21	Winchcomb—Water-supply Works	Rural District Council	Willeox & Raikes, Engineers, 63 Temple Row, Birmingham.
" 22	Shaftesbury—Water-tank, &c.	Guardians	J. Burbridge, Clerk, Bell Street, Shaftesbury.
" 24	London, N.—Pumping Machinery	Urban District Council	Engineer, Council Offices, Finchley, N.
" 27	St. Brides Minor—Tanks	Urban District Council	Council Offices, Brynmynyn.
" 27	Dublin—Bridges, &c.	Great Northern Railway	W. H. Mills, Engineer, Amiens Street, Dublin.
" 27	Saffron Walden—Regenerators, &c.	Gas Committee	A. H. Forbes, Gasworks Manager, Saffron Walden.
Dec. 5	Widnes—Pumping-engine	Corporation	I. Carr, Engineer, Widnes.
" 8	Cwmbach and Five Roads—Sinking Wells	Education Committee	W. D. Jenkins, County Architect, Shirehall, Carmarthen.
1906.			
Jan. 9	Auckland—Wharf, &c.	Harbour Board	W. & A. McArthur, 150 Leadenhall Street, London, E.C.
May 1	Talcahuano, Chili—Dock		Direccion de Material, Valparaiso.
IRON AND STEEL:			
Nov. 16	Ashford—Water Pipes	Urban District Council	W. Terrill, Surveyor, Ashford, Kent.
" 16	Broadstairs—Pipes	Gas Co.	F. Higginson, Engineer, Gas Office, Broadstairs.
" 18	London, E.C.—Wrought Iron and Steel, &c.	Thames Conservancy	Thames Conservancy Offices, Victoria Embankment, London.
" 20	Acton, W.—Castings for Pavement Covers, &c.	Urban District Council	W. Hodson, Clerk, Gothic Villa, Mill Hill Grove, Acton, W.
No date	Sandbach—Pipes, &c.	R.D.C. and Guardians	W. Wyatt, Engineer, 99 Radford Road, Leamington.
PAINTING AND PLUMBING:			
No date	Stamford—Painting, &c.	Corporation	F. R. Ryman, Borough Surveyor, Stamford.
ROADS AND CARTAGE:			
Nov. 17	Preston—Levelling, &c.	Corporation	Borough Surveyor, Town Hall, Preston.
" 18	Northwood—Paving	Urban District Council	W. L. Carr, Surveyor, Council Offices, Northwood.
" 20	Gower—Road Widening, &c.	Rural District Council	T. Gordon Bowen, Surveyor, Penygraig, Penclawdd, R.S.O.
" 20	Grimsby—Roads	Urban District Council	H. C. Scaping, Architect, Court Chambers, Grimsby.
" 21	Spennymoor—Kerbing, &c.	Highways Committee	C. R. Spencer, Surveyor, Council Offices, Spennymoor, Durham.
" 21	Sunderland—Levelling, &c.	Urban District Council	T. Young, Surveyor, 17 John Street, Sunderland.
" 21	Eccles—Street Works	Urban District Council	Borough Surveyor, Town Hall, Eccles.
" 22	Brynmynyn—Limestone and Gravel	Education Committee	Council Offices, Brynmynyn, Wales.
Dec. 27	Brynmman and Cwmbach—Paving, Metalling, &c.		W. D. Jenkins, Education Architect, Shirehall, Carmarthen.
SANITARY:			
Nov. 21	Aberdeen—Drainage Works	Town Council	W. Dyack, Surveyor, 41 1/2 Union Street, Aberdeen.
" 21	Winchcombe—Sewerage Works	Rural District Council	Willeox & Raikes, Engineers, 63, Temple Row, Birmingham.
" 22	Isleworth—Sewers, &c.		W. Burrough Hill, Surveyor, 81 Above Bar, Southampton.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
1906. Jan. 15	Hackney—Library	50, 30 and 20 guineas	£1 ts.	W. A. Williams, Town Clerk, Town Hall, Hackney.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

TENDERS—cont. from p. xiii.

London, S.W.—For the erection of baths at the corner of Park Hill and Clapham Park Road, for the Wandsworth Borough Council:—

Building works.

	A.	B.
G. Wales & Co. ...	£5,924 10 0	£6,531 4 0
W. & C. Brown ...	5,300 0 0	6,009 0 0
J. Nicks & Co. ...	5,474 6 0	5,871 15 5
C. Wall, Ltd. ...	5,288 0 0	5,862 2 3
Parsons & Townsend ...	5,370 0 0	5,843 15 0
J. E. Johnson & Son ...	5,280 0 0	5,801 0 0
Waring-White Building Co. ...	5,218 0 0	5,781 0 0
Holliday & Greenwood ...	5,177 0 0	5,704 0 0
R. Jones & Son ...	5,117 0 0	5,668 2 6
Marriott & Salter ...	5,100 0 0	5,637 9 1
A. N. Coles ...	5,131 0 0	5,594 4 6
A. F. Vigor & Co. ...	5,100 0 0	5,568 0 0
Read & Wilkinson ...	4,997 0 0	5,558 17 4
Pethick Brothers ...	4,980 0 0	5,549 0 0
Leslie & Co. ...	5,029 0 0	5,519 0 0
F. & H. F. Higgs ...	5,000 0 0	5,465 0 0
Kirk & Randall ...	4,996 0 0	5,454 0 0
J. & M. Patrick ...	4,900 0 0	5,420 17 0
E. Triggs ...	4,927 0 0	5,383 0 0
C. Ansell ...	4,839 0 0	5,311 0 0
F. G. Minter ...	4,765 0 0	5,292 0 0
Turtle & Appleton ...	4,780 0 0	5,286 0 0
Higgs & Hill ...	4,774 0 0	5,278 0 0
B. E. Nightingale ...	4,800 0 0	5,268 0 0
Hibberd Brothers ...	4,770 18 8	5,244 19 6
W. Smith & Son ...	4,791 0 0	5,237 0 0
H. Lovatt, Ltd. ...	4,743 0 0	5,236 0 6
A. Faulks ...	4,675 0 0	5,199 15 1
W. Johnson & Co. ...	4,758 0 0	5,199 0 0
Spencer, Santo & Co. ...	4,670 0 0	5,186 0 0
Martin, Wells & Co. ...	4,700 0 0	5,160 0 0
Jones Brothers ...	4,679 0 0	5,137 0 0
L. Whitehead & Co. ...	4,625 0 0	5,086 0 0
W. H. Hyde ...	4,498 0 0	5,011 16 0
W. Wallis ...	4,453 0 0	4,959 3 7
Cropley Brothers ...	4,500 0 0	4,937 19 4
Wisdom Brothers ...	4,411 0 0	4,916 2 0
J. Shelbourne & Co. ...	4,427 0 0	4,902 0 0
E. Wall ...	4,517 0 0	4,894 3 2
J. Garrett & Son ...	4,423 0 0	4,852 11 0
W. J. Fryer & Co. ...	4,396 0 0	4,766 7 0

Engineering works.

W. J. Fryer & Co. ...	2,075 0 0	2,820 10 6
J. Fraser & Son ...	1,743 0 0	2,697 13 0
G. Haden & Sons ...	1,342 0 0	2,307 0 0
J. F. Phillips & Son ...	1,237 0 0	1,873 0 0
Rosser & Russell ...	1,189 15 0	1,802 10 0
Stubbs, Son & Hall ...	1,187 15 2	1,672 14 0
Parsons & Townsend ...	1,165 6 0	1,784 13 5
T. Potter & Sons ...	1,152 10 0	1,529 8 0
Fraser & Fraser ...	1,138 14 3	1,802 12 8

	A.	B.
Tyler & Freeman ...	£1,111 2 1	£1,811 13 8
Korting Brothers ...	1,105 7 10	1,804 9 3
J. E. Bouz & Co. ...	1,083 11 7	1,718 13 11
G. E. Taylor & Co. ...	1,083 11 7	1,718 13 11
E. Busby & Co. ...	1,071 12 4	1,671 0 2
Mackenzie & Moncur ...	1,055 0 0	1,844 0 0
J. & F. May ...	1,055 0 0	1,655 0 0
Z. D. Berry & Sons ...	1,005 0 0	1,718 0 0
Dargue, Griffiths & Co. ...	997 3 8	1,802 3 8
H. Braithwaite & Co. ...	975 0 0	1,584 0 0

A.—Original design. B.—Alternative design.

London.—For alterations, &c., at Commercial Street Police Station. Mr. J. Dixon Butler, architect, surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son & Chidgey, Charing Cross Chambers, Duke Street, Adelphi:—

F. G. Minter ...	£8,063
Lathey Brothers ...	7,807
Grover & Son ...	7,874
Kilby & Gayford ...	7,830
Holloway Brothers ...	7,811
F. & H. F. Higgs ...	7,600
Mowlem & Co. ...	7,599
Lawrance & Sons ...	7,386
Harris & Wardrop ...	7,286
Chessum & Sons ...	6,964
H. Lovatt, Ltd. ...	6,950
Godson & Sons ...	6,885
A. Hood ...	6,799

London, S.E.—For the erection of a new sorting office at Dulwich, for H.M. Office of Works, &c.:—

R. Dean & Co. ...	£3,900
H. Kent ...	3,325
F. Kinnaird ...	3,050
Mattock & Parsons ...	2,989
C. Ansell ...	2,964
W. V. Goad ...	2,950
Perry & Co. ...	2,926
Holliday & Greenwood ...	2,914
J. F. Holliday ...	2,900
T. G. Sharpington ...	2,828
H. L. Holloway ...	2,817
J. Shelbourne & Co. ...	2,803
F. Webster & Son ...	2,786
Higgs & Hill ...	2,784
W. Smith & Son ...	2,695
J. Garrett & Son ...	2,690
Edwards & Medway ...	2,690
Cropley Brothers ...	2,690
H. Groves ...	2,674
F. & H. F. Higgs ...	2,666
J. Hollingsworth ...	2,639
Galbraith Brothers ...	2,635
Martin, Wells & Co. ...	2,600
F. & G. Foster ...	2,527
W. H. Hyde ...	2,467
J. & W. Drake ...	2,461

Paignton.—For the erection of new business premises, for Paignton Co-operative Society. Messrs. Bridgman & Bridgman, architects, Torquay and Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton:—

Plymouth Co-operative Society ...	£4,145 4 1
H. & W. Pollard & Co. ...	3,988 6 2
R. F. Yeo & Sons ...	3,820 8 3
R. Wilkins & Sons ...	3,688 0 0
H. C. Goss ...	3,643 0 0
H. C. Jackson ...	3,511 10 10
R. E. Narracott ...	3,504 2 6
J. Mumford ...	3,497 9 0
W. E. Blake ...	3,294 0 0
G. Arscott & Son ...	3,170 0 0
W. Smaridge, * Paignton ...	3,110 10 5

* Accepted.

Sacriston.—For the erection of new lock-up, for the Standing Joint Committee. Mr. William Crozier, A.M.I.C.E., county architect and surveyor, Durham:—

M. R. Draper & Son, Leamside ...	£1,382 15 0
Wright & Freeman, Newcastle-on-Tyne ...	1,268 1 8
J. G. Brown, West Hartlepool ...	1,184 10 2
W. Lodge, Durham ...	1,175 10 0
W. C. Atkinson & Son, Stockton-on-Tees ...	1,165 9 2
G. P. Gillhespy, Boldon Colliery ...	1,150 5 7
J. G. Bradley, Durham ...	1,117 14 0
J. Burnett & Sons, Birtley ...	1,100 19 1
J. B. Stott, Sunderland ...	1,100 0 0
C. Groves, Chester-le-Street ...	1,089 9 5
W. Norman, Chester-le-Street ...	1,064 7 2
Craig Brothers, * Sacriston ...	1,049 6 0

* Accepted.

Worthing.—For the erection of five dwelling-houses. Northcourt Road. Mr. G. J. Hagger, P.A.S.I., architect and surveyor, Worthing:—

J. A. East ...	£1,980
A. Crane ...	1,600
H. Herbert ...	1,510
A. Parsons ...	1,500

* Accepted.

Ynysboeth.—For the erection of nine houses at Ynysboeth, near Abercynon, for the Miners' Homes Land and Building Co. Messrs. Ivor Jones and T. E. Pickards, A.A.R.I.B.A., architects, 18, St. Mary Street, Cardiff, and 106, Israd Road, Pentre:—

Knox & Wells, Cardiff ...	£2,802 0 0
W. Hames ...	1,845 0 0
Parry & Davies ...	1,672 10 0
J. Howells ...	1,665 0 0
C. Nicholls ...	1,539 0 0

* Accepted.

[Rest of Abercynon.]

(Continued on page xviii.)

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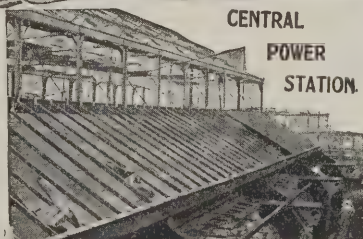
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TENDERS—cont. from p. xvii.

London.—For the supply and erection of hydraulic penstocks and gear at the Falcon Brook pumping station, for the London County Council:—

Arnold Goodwin & Son, Ltd., Sumner Street	£1,029
Yates & Thom, Ltd., Blackburn	1,012
Ashton Frost & Co., Ltd., Blackburn	955
Glenfield & Kennedy, Ltd., Kilmarnock	847
John Cochrane, Barrhead, N.B.	825
Hunter & English, Bow Road	780
J. Blakeborough & Sons, Brighouse	633

* Recommended for acceptance.

London, S.E.—For electric-light wiring and fittings at the new station in course of erection at Lee Green, for the London County Council:—

Barlow & Young, 8, London Street, E.C.	£240 0 0
W. H. Johnson, 200, Upper Kennington Lane	183 15 0
J. O. Grant & Taylor, 63, Queen Victoria Street	175 0 0
Oliver Clark & Co., North Kensington	170 0 0
F. J. Coleby & Co., 7, Thayer Street, W.	164 10 0
Roger Dawson, Ltd., 8, Berners Street	160 0 0
Durell & Co., 58, Finchchurch Street	160 0 0
The National Electric Construction Co., Ltd., 34, Victoria Street	157 0 0
J. Defries & Sons, Ltd., Houndsditch	155 0 0
Hooper, Neary & Co., Greenwich	141 10 0

* Recommended for acceptance.

Pontypridd.—Accepted for the erection of twenty-eight workmen's cottages at Phillips Street, The Graig, Pontypridd. Mr. T. R. Phillips, architect:—
Williams & James, Coedpenmaen, Pontypridd £3,920

Shepperton.—For the erection of a new public elementary school for 430 children, for the Middlesex Education Committee. Mr. H. G. Crothall, architect, Guildhall, Westminster, S.W.:—

J. Ward & Son	£5,568
Patman & Fotheringham	5,450
Treasure & Son	5,409
F. G. Minter	5,371
Fassnidge & Son	5,365
W. Blackburn	5,300
C. F. Kearley	5,253
A. & B. Hanson	5,202
J. Barker & Co.	5,128
T. H. Kinglerlee	5,087
Wisdom Brothers	5,040
F. Gough & Co.	4,984
W. Lawrence & Son	4,974
Knight & Son	4,820
J. Dorey & Co.	4,799
W. J. Renshaw	4,765

Mr. A. A. Paterson, architect, has in hand the new additions to the municipal buildings at Helensburgh, the total outlay on which will be £6,000.

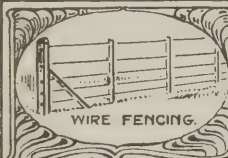
Colonial House, Liverpool, the large block of new offices for Messrs. Elder, Dempster, & Co. at the corner of Water Street and Tower Gardens, has been opened. The building has a total frontage of 284ft., and is built of Cefn stone, with granite pillars. The office staff department is 140ft. by 70ft., lighted by seven domes.

Proposed Subway at Tunbridge Wells.—At Tunbridge Wells it is proposed to form a subway 53ft. long under the South-Eastern Railway from the Upper Grosvenor Road to the east end recreation ground.


Villa Asylums.—The villa system is to be adopted by the Hoddington Lunacy Board. Each villa is to accommodate thirty-five patients. The estimated expenditure works out at £100 per bed, exclusive of heating (£20 more per bed), lighting and painting.

A South African War Memorial at Gateshead, in Saltwell Park, was unveiled on Saturday by Lieut.-General Sir John French. It was designed by Mr. F. Doyle Jones, of Hartlepool and Chelsea, and is surmounted by a bronze figure of "Peace crowning the heroes."


Fears for the safety of the Tower of Cripplegate Church, which is nearly 800 years old, have lately been entertained. Expert opinion has been taken, and while there is no reason for serious apprehension, the stonework, which is a facing of Kentish rag, is crumbling away. A scheme is about to be devised for re-facing the tower.



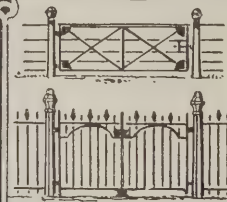
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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

November 22, 1905. Vol. 22, No. 563.

6, Great New Street, Fetter Lane, E.C.

Summary.

In the paper on American methods of erecting buildings which he read before the R.I.B.A. on Monday night, Mr. R. A. Denell ascribed differences in practice to changed conditions, and thought that "skyscrapers," which had caused somewhat of a revolution in building methods, were simply the outcome of commercial evolution. (Page 301.)

A number of architects have petitioned the Institute to hold an open competition for their proposed new premises. (Page 300.)

A big competition is likely to be held for the proposed extension of the Birmingham Council House, to cost £137,000. (Page 300.)

The Edinburgh Architectural Association in connection with the Brooklyn Museum of Arts and Sciences proposes to issue a five-guinea volume on architectural refinements, comprising 250 plates. (Page 298.)

A correspondent raises the question of the employment of foreign fireproof floors in buildings on Crown property. (Page 299.)

The old foundations of St. Mark's Campanile at Venice have been added to and cut into, with the result that there is only a nucleus of old work in the centre of the new tower. 3,076 larch piles have been driven. These are calculated to have a total bearing capacity of 90,000 tons. The weight of the new tower is estimated at 20,000 tons. (Page 290.)

Mr. Gotch read a paper on "English Manor-houses" before the Architectural Association last Friday. Speaking of the time when the Italian influence began to be felt, he said the actual causes of the change of style in mediæval times had never yet been thoroughly explained. How was it that within ten or fifteen years the forms given to the ornamental parts of buildings should have altered so completely as to constitute a new and distinct style, and that the change should have affected work over the whole country at the same time? (Page 294.)

Huge new law courts are being erected in Rome. They are the outcome of a competition held as far back as 1885, and are likely to cost £1,316,000 when complete—in 1908. (Page 290.)

Gas-producer plants for builders are rapidly winning favour. Indeed, there can be little doubt that for moderate loads—say, from 20 to 200 horse-power—this form of energy has an immense future. It is claimed that, under ordinary working conditions, power may be produced at from $\frac{1}{2}$ d. to $\frac{1}{4}$ d. per brake-horse-power hour. (Page 299.)

External Treatment of Basements and Ground Floors.

In Renaissance work the treatment of the basement of a building received the careful consideration of architects. Basements included the lower horizontal division of an elevation, and might include two storeys, while even with one storey this might be what we now call the ground floor. By virtue of its position the lower portion of an elevation seems to need some emphasis so as to give that appearance of strength necessary to sustain the upper floors. In Renaissance design this becomes of increased necessity when columns or pilasters make up the façade and the upper treatment is of an elaborate nature, requiring some simpler treatment below to give a restful effect. An appearance of strength is generally given by rustication of the masonry, such as vermiculating the surface or using rough-hewn blocks. We have already taken objection to vermiculated work, because of its worm-eaten appearance, its facility for collecting soot and the subsequent sure decay of the stone. Rough-hewn or axed work is very suitable, as it is economical, while the unevenness of surface breaks up the light falling upon it and gives a feeling of greater strength than can be obtained by any other means. The reason of this effect is probably due also to the display of the texture of the stone, from which the mind instinctively grasps the strength of the material. If, however, the treatment of the elevation does not require so much emphasis, sufficient strength of appearance can be obtained by sharply defined lines of joints and the use of large blocks. Windows are frequently made smaller and fewer, and not emphasized more than necessary by surrounding mouldings. Still, another treatment has been adopted recently, namely, the use of a stone of stronger structure, such as granite: the granite, however, is often polished, and this destroys the effect. If granite is intended to give an appearance of strength it must be unpolished. But there is another treatment which has not been much adopted, namely, to add strength by means of colour, such as the use of a darker stone or a stone of stronger colour. It is often inadvisable to use rough masonry, especially in towns with smoky atmospheres, where decay and dirt in a few years produce a distressing effect. Where expense may forbid the use of granite, then we suggest recourse to the use of a stone of a different colour.

The Roaming Assistant.

READERS will recollect that the late Mr. Alfred Waterhouse bequeathed a number of legacies to the assistants who had been with him at one time and another throughout his distinguished and busy career, and very general appreciation of the man's generosity has been expressed. It is not often that architects' assistants are rewarded in such a way and some recognition is made of the services which they have rendered to their principal. We note in this connection that one of our American contemporaries takes occasion to point out what a roaming item the modern architectural draughtsman has become by reason of the strenuous times in which we live—times which compel architects and builders to do their work at a speed which the world has probably never seen before. Our contemporary observes that formerly a draughtsman, once he had proved his ability, felt that he was a fixture in his employer's office just so long as his own inclinations were satisfied. "Nowadays, however, most draughtsmen know that they are not engaged by the year or even by the month, but almost always and merely 'by the job'; and when the job is finished and they are once more thrust out into the stream of their fellows, ever seeking another job, they hardly perceive with how real an inhumanity they are being treated, an inhumanity their recent employers in many cases did not themselves experience. The consequence is that the draughtsman of to-day is, and must be, a permanent member of the country's floating population, to the detriment of his own happiness and the injury of his moral and business well-being. It is unfair and unjust, but so far as we can see the situation has but a single cure, and that is so radical a one that we hesitate to express our views." Like the writer of the thrilling serial, our contemporary here breaks off and leaves us tingling to know what it would do. Instead of telling us that, we are merely left with the reflection, based on the late Mr. Waterhouse's gifts to his assistants, that "evidently life in England is, even to-day, less strenuous than it is here." Probably that is so, but then there are not enough bequests to go round, and we are sure the many thousands of assistants in architects' offices in this country will agree that even in drowsy England life is not all sweet and quiet, with never a prod to remind them that they are part of the floating population. The problem of the unemployed has many phases.



THE HUGE NEW LAW COURTS IN COURSE OF ERECTION AT ROME: TOTAL ESTIMATED COST, £1,316,000. SIGNOR CALDERINI, ARCHITECT.

NEW LAW COURTS AT ROME.

A VERY large building in Rome—the new Law Courts—is being erected. The design was secured in competition. First a competition was held in 1883, but none of the designs sent in were considered suitable, and a second competition was held two years later, in which Signor Calderini was successful. In 1889 the building was begun. It had been fixed in a law of 1885 that, exclusive of bas-reliefs, statues and frescoes, the cost of the work should be approximately £320,000. As a matter of fact, says the Rome correspondent of the "Morning Post," Signor Calderini's accepted estimate for the whole work was £1,080,000, and even that enormous sum has been quite inadequate. The whole of it had been spent by last year, when the Giolitti Cabinet applied to Parliament for a supplementary vote of £236,000, to be spread over the four years 1904 to 1908, by which time—a quarter of a century from its inception—it is hoped that the building will be finished. Thus, from first to last, the Palace of Justice will have cost the nation £1,316,000. The building occupies a commanding position on the right bank of the Tiber, exactly opposite the new Ponte Umberto I. In the courtyard four seated statues are seen, representing Licinius, Julianus, Modestinus and Gaius, while behind them are figures of Cicero and Papinian; above, along the front of the Palace, fourteen medallions contain portraits of great jurists of more modern times; over the doorway is Justice, enthroned between Law and Force; and above this large group two stone wolves, nourishing Romulus and Remus, personify the legendary foster-mother of the Romans. All round the building runs a frieze of bulls' heads, with here and there a lion's head above the frieze, while inside there are eagles in plenty. There is an inner court, also adorned with four sitting statues, above which will be placed a colossal statue of the Law. On the ground floor are three assize courts and four other tribunals, but there is an immense waste of space in corridors, passages and courtyards, and the result has been to make the actual courts unduly small. One great advantage, however, which the Italian Courts will possess is in the admirable lighting and ventilation and the heating arrangements. A fine double staircase ascends to the first floor, on which are situated the court of appeal and the Corte di Cassazione, while on the

second floor are a large library (one of six scattered about the Palace) and six civil courts. Three kinds of stone have been used for the building—that of Brescia for the staircases and that of Tivoli and Cività Vecchia for the outside work. Of the interior decorations it is too early to judge, for the painting of the frescoes is only just beginning.

ST. MARK'S CAMPANILE.

The Construction of the new Foundations.

AN authoritative article on the foundations of St. Mark's Campanile at Venice, by Mr. Horatio F. Brown, appeared in the "Times" for Thursday last. The foundation work is rapidly approaching completion, and it is hoped to begin the building of the new tower in January next. When it had been decided to rebuild the campanile after the fall on July 14th, 1902, considerable discussion arose as to what should be done with the old foundations, some authorities urging their entire removal and substitution by new foundations, and others (on the fact that the collapse was not attributable to any weakness of the old foundations) that they should simply be enlarged to suit the new tower. The work actually carried out is a compromise between these two contentions. A ditch about 16ft. deep and 12ft. wide was dug all round the old foundations and carefully bratticed, and into this area were driven 3,076 larch piles, fresh cut so as to ensure abundant resin. The average diameter of the piles is 8½ ins. and the average length 13ft. They were driven home to almost absolute resistance, that is to say, till they yielded only 1 millimetre to each blow from a weight of 570 lbs. raised 4ft. 6ins. They are calculated to have a carrying capacity of 30 tons each, giving a total carrying power of about 90,000 tons; the weight of the tower they are to support being estimated at 20,000 tons. The driving of these 3,076 piles was a slow process. It was carried on by the primitive method of hand-rope and pulley and weight; eleven ropes and eleven hands to each pile-driver. Day after day all through the summer, from behind the palisade that hid the works, came the long monotonous drone of the foreman giving the time to his hands.

At length on October 8th, 1904, the initial step of pile-driving was completed; and

having now reached the level of the old platform the question of bonding the new work into the old came up for consideration. The new platform had to be superimposed upon the old, and this led to the latter being cut into for a depth of 8ft.; the new platform in its upper layer was then laid on the top of the old, a union which, says Mr. Brown, is neither complete nor quite satisfactory. The new platform, like the old, is made of two layers of oak beams, fresh cut. The lower layer runs parallel to the sides of the foundations, the upper is laid across; but at each angle there is a third layer, placed in the form of a fan of seven sticks, an ingenious device by which the pressure at the angles is distributed over a wide area. The layers are fastened together by pins of dog-wood, and the interstices filled in with cement and chips of the porous Monselice stone. The question of bonding the platform has virtually decided the fate of the old foundations, for the incision of 8ft. all round means 19½ft. of new foundations in every direction, and leaves only 200 cub. metres of the old foundations as a mere nucleus in the centre of the new tower. On the top of the new platform come massive blocks of Istrian stone in eleven courses, stepped inwards. These blocks are bonded into the old foundations to the depth of 6ft. 6ins., the largest blocks being 9ft. 9ins. long and 4ft. 7ins. wide; so that, as a matter of fact, the new campanile will rest almost entirely on new foundations and a new platform, while its weight will be borne partly by new and partly by old piles. As regards cost, it is likely to be well within the £8,000 estimated for the construction of the new foundations.

Housing the Very Poor.—In Dublin last week the first block of buildings erected by the recently-founded Association for the Housing of the Very Poor was formally opened by the Lord Mayor at Sumner Street, on the south side of the city. This block comprises 116 tenements, two shops and men's reading-room; but it is the intention to proceed with the second portion on the east side of Sumner Street—comprising 138 tenements, baths and washhouses—as soon as the requisite funds have been obtained. The entrances from the street and staircase give access in each block of the dwellings to two tenements on each floor and two in the rear. The rents vary from 1s. 6d. to 2s. per week. Mr. Arthur Dudgeon is the architect and Mr. J. B. Pite the contractor.

SOCIETY OF ARCHITECTS.

Presidential Address.

THE opening meeting of the session of the Society of Architects was held on Thursday last at Staple Inn Buildings, Holborn, when the new president (Mr. A. E. Pridmore, F.S.I.) delivered his inaugural address. In connection with a summary of the inception and history of the Society (which was founded in 1884) Mr. Pridmore dealt with

The Question of Registration.

He said a representative body of architects met in London in 1886, when it was determined that it would be in the best interests of the profession to make it compulsory for all architects to hold a Government diploma, and that a committee should be formed to consider the best means to obtain an Act of Parliament for that purpose. A circular was then issued to about 2,500 architects practising in the United Kingdom, with a request to sign, if they thought fit, a declaration in favour of obtaining legislative powers making it obligatory that all persons thereafter entering the profession should be duly qualified by examination. About 1,300 favourable replies having been received, the "Architects' Registration Bill Committee" was formed, by whom a Bill was introduced into Parliament in 1887 which included architects, civil engineers and surveyors. The two latter professions raised certain objections, and a fresh Bill was introduced dealing only

with architects. The Society, said Mr. Pridmore, had been most persistent and energetic in its attempts to secure registration, and Bills had been introduced from time to time—the last having been set down for second reading in the last session of Parliament, but owing to pressure of public business unfortunately was not reached. In December, 1902, the Architects' Registration Bill Committee was amalgamated with the council of the Society of Architects as a general registration committee under the chairmanship of the president of the Society for the time being. It had since been ascertained that about two-thirds of the members of the profession had declared themselves in sympathy with the movement for obtaining the statutory examination and registration of all persons entering the profession.

Various Matters.

The president then proceeded to refer to various matters connected with the Society, such as the library, municipal engineers and surveyors, &c., particulars of which will be found in the annual report (see page 238 of our issue for October 25th).

Speaking of the financial condition of the Society, he said that seven years ago they had a deficit of £150, while now there was a reserve fund of £1,100.

The London Building Acts (Amendment Act) of 1905

called for his attention. This was proposed to come into force on January 1st, 1906, and was a modest measure of about forty-three

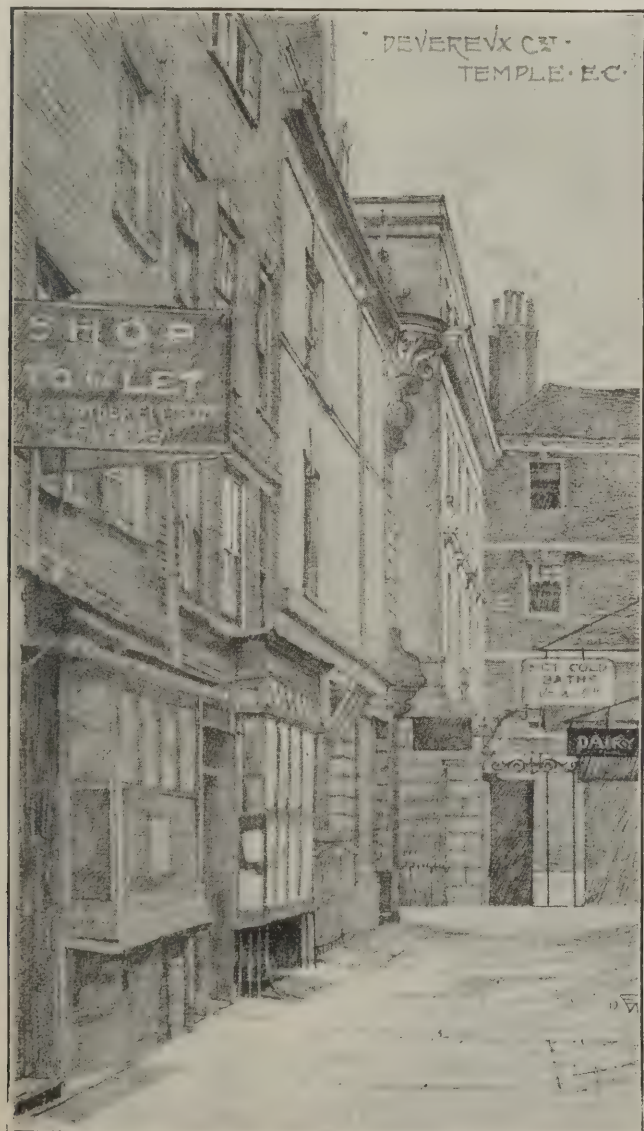
sections, instead of the 196 included in the first proposed Bill. Its effect was limited to the provision and maintenance of proper means of protection and escape in Metropolitan buildings in case of fire, and he thought it would be admitted that the promoters of the Act had reasonably dealt with the requirements of the public.

It was, however, clear that when that Act came into operation next year property owners and others interested in buildings throughout the Metropolis would be compelled to incur considerable expense in carrying out the requirements of the London County Council.

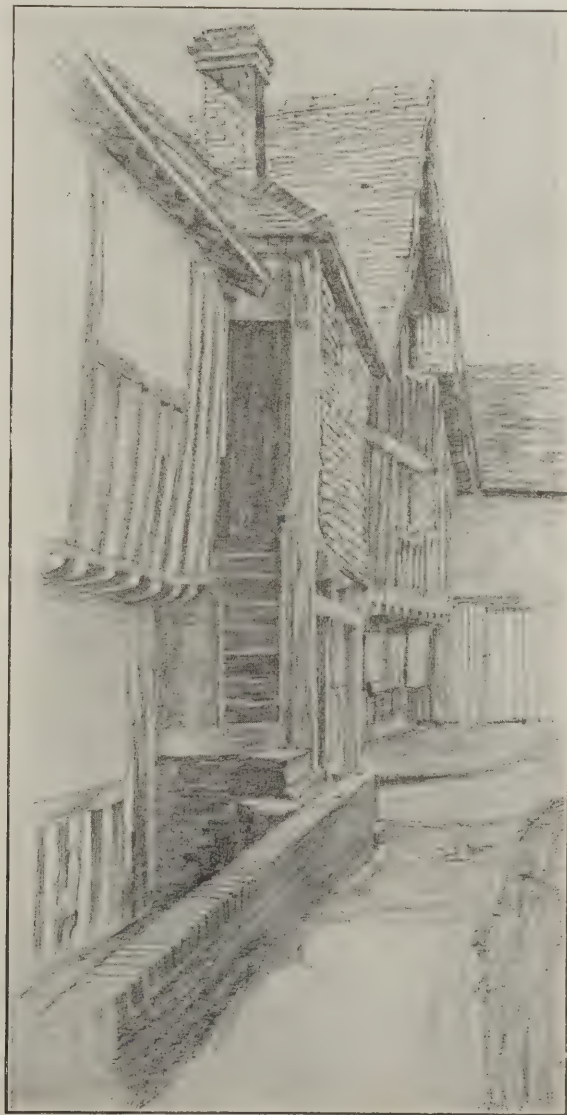
The president then proceeded to give advice to students, urging the importance of draughtsmanship, geometry and the knowledge of materials, and then went on to speak of

London Street Improvements.

One of the most important improvements deserving immediate attention was, he said, the main thoroughfare connecting the north of London with the City at the north end of Bishopsgate Street Without. Part of this improvement had been carried out by the clearance of numerous dilapidated houses in order to permit the erection of the terminus buildings of the Great Eastern Railway at Liverpool Street, which resulted in the thoroughfare being partially widened, but not right through. The remaining houses should be removed, as they were a source of danger to traffic. Constitution Hill



Devereux Court, Temple.



The Lych-gate, Penshurst, Kent.

DRAWN BY MISS ETHEL WILLIAMSON.

should be widened to the same width as the Mall.

The Proposed Westminster Improvement was not far-seeing, as there might be a time when even the Houses of Parliament would require extra buildings; therefore the Victoria Tower Gardens should be continued the same width along the new Embankment, skirting the Thames as far as Horseferry Road. Further, Horseferry Road might in the future become a main thoroughfare, in conjunction with the Lambeth Road on the Surrey side, and 50ft. was insufficient. It should certainly be nearer roof, in width than 50ft., and Lambeth Bridge should be reconstructed during the next decade to conform with the streets on either side of the river. It should be made one of the most important bridges of the Metropolis, thereby

relieving the traffic over Westminster Bridge and beautifying the surroundings of the Houses of Parliament.

Proposal to take down St. Clement Danes Church.

Mr. Pridmore said he was opposed to the widening of Blackfriars Bridge by adding a few feet to it, as done with London Bridge. A new bridge was necessary to cross the river at Temple Pier about midway between Waterloo and Blackfriars Bridges, with a street to the central entrance of the Law Courts in the Strand one way and a street to St. George's Circus, Southwark, the other; this would link up with Aldwych; but to carry this scheme out in its entirety the church of St. Clement Danes, which was externally far from pleasing and stood awkwardly in the road, should be taken

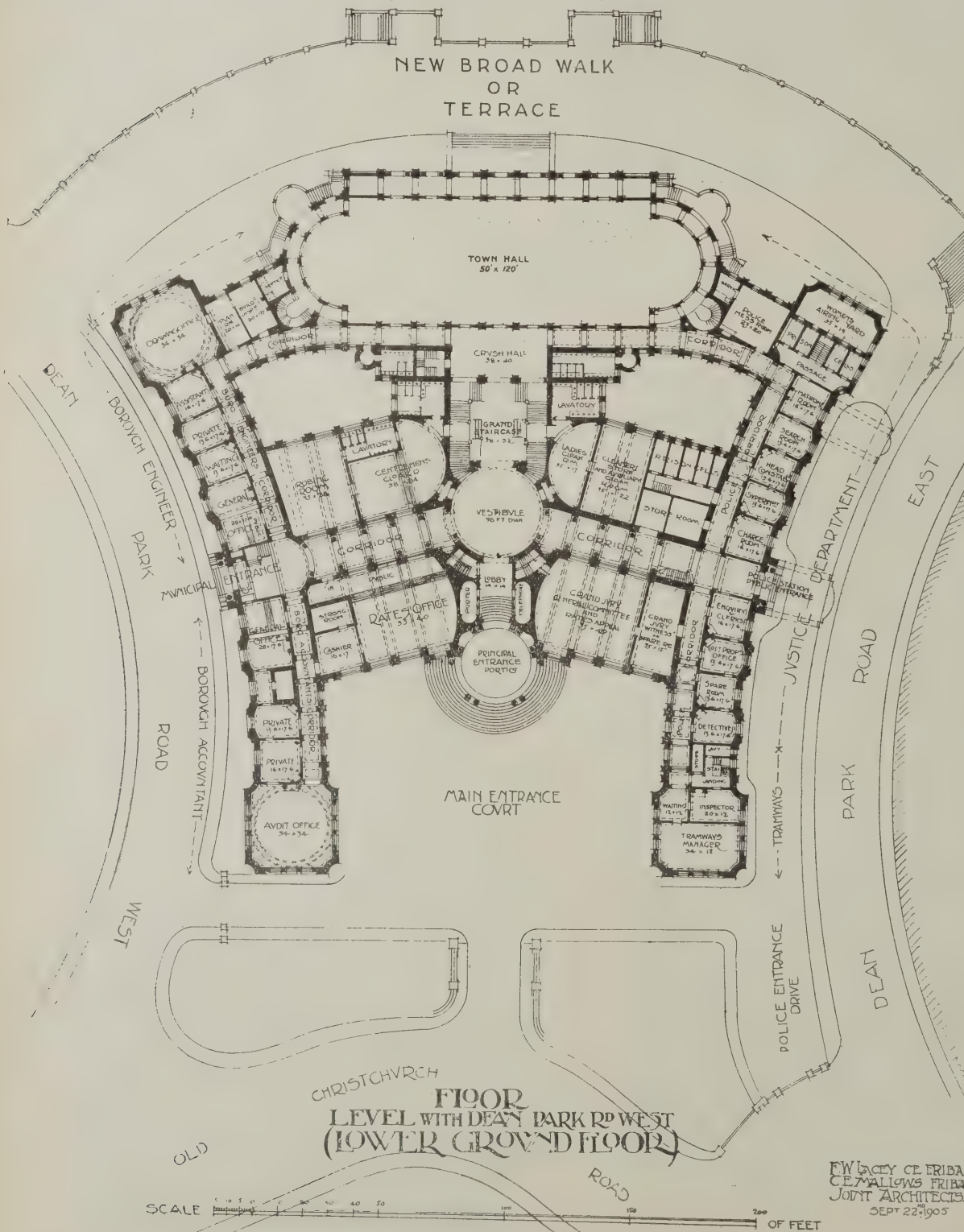
down, retaining the tower. London was seriously underbridged, and new bridges should be erected, and architects appointed to assist in designing the architectural features and details of them.

BOURNEMOUTH MUNICIPAL BUILDINGS.

WE illustrate herewith the design for proposed municipal buildings, law courts and town hall for Bournemouth which has been prepared by Mr. F. W. Lacey, C.E., F.R.I.B.A., borough engineer of Bournemouth, and Mr. C. E. Mallows, F.R.I.B.A., of London. The scheme shown has been approved by the Bournemouth Town Council, and has now only to go before the Local Government Board.

The site proposed is an irregular one with frontages to Dean Park Road West, Christchurch Road and Dean Park Road East. The varying levels of the ground have afforded an opportunity (which is quite unique) of planning a building in such a manner that three distinct ground-floor levels are obtained, each with a separate entrance from the street. At the northern end it is proposed to form a new broad walk or terrace, from which access is given to the town hall. The law courts are placed upon the east side of the building and the municipal buildings on the west side, the principal entrance being arranged in the centre of the front facing Christchurch Road. The entrance to the municipal buildings is in the centre of the Dean Park Road West elevation, and is also an additional entrance to the council-chamber, reception hall and committee rooms on the first floor. The main entrance to the law courts is also centrally placed on the Dean Park Road East elevation. Two large courts are planned on the ground level on either side of a wide corridor leading to the circular reception-room above the vestibule, the various other rooms for witnesses, &c., being conveniently placed along the front, with a corridor behind.

The police-station is planned beneath the law courts group, as shown by the accompanying plan. The work is estimated to cost £78,000 for the municipal buildings and law courts, and £48,000 additional for the town hall.



PROPOSED MUNICIPAL BUILDINGS, TOWN HALL AND LAW COURTS FOR BOURNEMOUTH.



DESIGN FOR PROPOSED MUNICIPAL BUILDINGS, TOWN HALL AND LAW COURTS AT BOURNEMOUTH. F. W. LACEY AND C. E. MALLOWS, F.F.R.I.B.A., JOINT ARCHITECTS.

THE ARCHITECTURAL ASSOCIATION.

Mr. Gotch on English Manor-houses.

A MEETING of the Architectural Association was held on Friday evening at 18, Tufton Street, Westminster, the chair being occupied by the president, Mr. E. Guy Dawber, F.R.I.B.A.

The following were elected members of the Association:—Messrs. Winter Rose, Philip E. Webb, J. W. Jarvis, A. C. Bridger, H. L. Kiddle, J. Seddon, B. Clough Williams Ellis, H. G. Taylor, J. E. Henderson, R. C. Adamson, R. W. A. J. Cosway, G. W. Goslin, W. H. Hatchard Smith and G. Flint Clarkson.

The following further donations to the building fund were announced:—

	£	s.	d.
H. P. G. Maule (2nd donation)	-	-	5 5 0
C. R. R. Clark	-	-	2 2 0
F. S. Chesterton	-	-	1 1 0
W. Dewes (2nd donation)	-	-	1 1 0
H. White	-	-	1 0 0
F. T. Baggallay	-	-	0 10 6
C. H. Brodie	-	-	0 10 6
A. E. Bullock	-	-	0 10 6
A. O. Collard	-	-	0 10 6
W. J. Davies	-	-	0 10 6
H. T. Hare	-	-	0 10 6

The president proposed a vote of thanks to Professor Henry Adams for a donation of several samples of wood and stone to the Association, after which he announced that he would be "At Home" at 18, Tufton Street on December 8th, at 8.30 p.m., when an exhibition of work done by students during the summer would be held.

Mr. J. A. Gotch, F.R.I.B.A., F.S.A., then read a paper on "Old Manor-houses"—not necessarily manor-houses in the technical sense of being the dwelling-place of the lord of the manor, but rather those of medium size and importance, of which the ordinary manor-house is the type.

There were many houses of the kind in existence even in the days which we are accustomed to picture to ourselves as being dominated by castles. But a great number of them have disappeared, having been replaced in many instances by more modern dwellings.

Consequently, early houses are not very numerous, and most of those which have survived have undergone frequent alterations. It is therefore difficult to find examples of untouched domestic work. Nevertheless, by comparing one fragmentary specimen with another, it is possible to ascertain what were the main lines upon which they were built.

The General Arrangement.

Many of them were not strongly fortified, even in the turbulent times of the Edwards. They were arranged with a view to defence, it is true, with thick walls and small windows, but it was defence from a casual attack and not from a set siege. They were generally surrounded by a moat, and the stronger ones were furnished with a drawbridge and portcullis; but many of them had merely an ordinary bridge and a strong door. The larger sort were built round a courtyard, which was entered either through a gateway in the house itself or through a gatehouse set in a wall of enclosure. These early dispositions, which took their rise from the necessities for defence, were retained long after the need for such precautions had disappeared; and, without any conscious endeavour on the part of the builders, they added piquancy and interest to the composition.

Were the Old Houses the outcome of Careful Design?

An interesting speculation which suggests itself is how far were these old manor-houses the outcome of careful and pains-taking design? How much was there of intentional composition in the grouping of their parts? The answers to these questions would probably be found to be "Not very

far" and "Not very much." There was, we must remember, a particular style in vogue at each period and a particular type of plan. Half the difficulty of the present-day designer, therefore, was removed at once, or, rather, it never arose. The wants to be supplied were simple, and so also were the means of supplying them. There were a few well-recognized apartments which had to be provided in every house; if more accommodation were required it was added in the simplest way and without much endeavour to harmonize it with the rest of the building. Hence, the planning of many old houses is very haphazard, with the result that their appearance is picturesque; but it may be doubted whether the designer aimed intentionally at a picturesque effect. In fact, half the delight which these old houses inspire arises from their unstudied beauty; they look as inevitable as a natural growth. The masons had their traditional methods of solving the simple problems with which they had to deal, especially as regards the smaller and less pretentious houses. In those of more importance a greater foresight was often exercised, and where a "surveyor"—or, as we should now style him, an "architect"—was employed a good deal of skill was displayed. No one can examine John Thorpe's drawings, for instance, without coming to the conclusion that he was a very ingenious planner and always bore in mind the outward effect which the disposition of his various rooms would produce.

Stone the Predominant Material.

But now let us consider in detail some old manor-houses of various dates and from all parts of the country. We shall see how much they have in common, and yet how widely different they appear, owing largely to the materials of which they were built. They were naturally influenced in great degree by local conditions. Most of them are built of stone. Where stone was not readily procured, the walling was perhaps of brick or of timber and plaster, but even then stone was used for the ornamental portions; not so much in half-timber work, because the wood was easily worked. But, in regard to brick, and its ally terra-cotta, although they furnish some fine examples in certain districts, yet in point of number they are comparatively insignificant. They occur chiefly in the southern and eastern counties, and even there the mouldings of the windows and doors will sometimes be found to be worked in plaster or cement in imitation of stone.

The first example which we shall consider is

Longthorpe Tower.

situated in a small village of that name about two miles west of Peterborough, the village of which Thorpe Hall is now the principal house, a fine and interesting specimen of the work of Inigo Jones's son-in-law, Webb. The tower is of very different character from the Hall. It was a country-house of the abbots of Peterborough, built for peaceful purposes, but made of sufficient strength to render it secure against casual attack. There is not much left of the original building besides the tower and the end of an apartment which may have been the hall. This is of Early English date, and may be put at about 1250. What the original accommodation may have been is a matter for conjecture; but it probably consisted of a hall, the tower, in which the abbots' private rooms were placed, and some kitchens which have disappeared, possibly because they were built of wood. The house has undergone many alterations. At the end of the limb, which was presumably the hall, there is a fifteenth-century window on the ground floor and a seventeenth-century window above it. There is also a wing of the latter date, and a further addition of modern times. In fact, the house shows signs, like nearly all ancient dwellings,

of continuous occupation and continuous changes to meet changing conditions.

The Most Interesting Part

is the tower itself, which is a Midland version of the northern peel-towers. It consists of only three floors, whereas in the towers of the north of England and south of Scotland there are usually five floors; but it must be remembered that northern peel-towers were generally self-contained and had no adjoining apartments. The ground floor here is provided with extremely small windows, only 4ins. wide; the other two floors, being less accessible from outside, have windows of more cheerful size; but even in the case of the middle storey, which was the chief apartment, it was considered necessary to enlarge the original windows in the seventeenth century. The lights of the two lower storeys are glazed, and it is not impossible that those of the principal room were glazed from the outset, but glass was far too great a luxury to be bestowed upon inferior rooms, and in those days all but the most important windows were provided with nothing more than shutters. The windows of the top floor at Longthorpe have clearly never been glazed from the outset to this day, and it is needless to say that the room is not used for domestic purposes. The ground-floor room was approached from the adjoining building, and so also was the room above it; but access to the topmost room was gained by a narrow staircase in the thickness of the wall, and from this room a second staircase wound round a newel up to the battlements of the roof. The ground floor was merely a cellar or store-place; the first floor, which alone has a fireplace, was the solar, or lord's private room; while the room over it was probably devoted to his retainers as a sort of watch-tower. In this room there is a latrine in the thickness of the wall.

There were probably some outer defences to the house, but, if so, they have entirely disappeared, including the moat, which must almost certainly have existed.

The next house in point of date is

Woodcroft Castle.

not far from Stamford. This presents features which are absent from Longthorpe, but lacks others which exist there. For instance, there is no ancient staircase, nor any sure indication of where it was. The whole place has been more drastically remodelled inside, and restoration (necessary no doubt) has played havoc with the ancient arrangements. On the other hand, the moat remains, and the entrance gateway, as well as the chapel above it. Although called a "castle," the house was nothing of the kind; it was not even strongly fortified, since there are no indications of either a drawbridge or portcullis. It depended upon its gates for preventing unwelcome access, and upon its moat, its thick walls and narrow windows for security in other respects. It seems to have been of much greater extent originally, and to have occupied most of the area enclosed by the moat. Of the remains left not many rooms can be identified with certainty. There is no doubt, of course, about the archway, which was the entrance; the small room on its right was probably the porter's, and the large one on the left was perhaps the guard-room. There is nothing to show where the hall and kitchens were. It is equally certain that the room over the archway was the chapel, since the piscina still remains; and there was a gallery over part of the chapel, as indications exist of the gallery front and of the stairs of access.

The round tower, which has survived, was balanced by another at the other end of the front, which has completely disappeared, but it is impossible to say whether there was a tower at each of the other corners. The whole treatment of the place has a somewhat unfamiliar air, and it is quite

possible that a foreign architect (shall we call him?) may have been sent from the Abbey of Peterborough, which is not very far distant.

This place also has work of different periods. The original house was built in the closing years of the thirteenth century; the east wing was either built or remodelled in the fifteenth; the chapel was made into a living-room in the seventeenth; and in the nineteenth many evidences of its previous history were blotted out.

Kirby Muxloe.

Nearly two centuries had elapsed before the next house of our series was built. It is at Kirby Muxloe, in Leicestershire, and is again wrongly called a castle. Castle it was not, but a fortified dwelling-house, rather more carefully fortified than the former examples. Unlike them, it was not in continuous occupation for very long; there is no history attached to it, nor are there any contemporary records to throw light upon its origin or decay, but judging by the excellent preservation of the little moulded work which has survived, it could not have been subject to the wear and tear of daily life for any great length of time. Unlike them, too it is built of brick, but its mouldings are of stone. There is not an abundant supply of stone in that district, and what there is is hard to work; accordingly, the detail is large in scale. The actual remains of the house are not extensive, but the outline of the walls can still be traced, and they indicate that it must have been of considerable size. It was surrounded by a moat which washed the walls on every side, and the main disposition was almost truly symmetrical. This fact is interesting in view of the dominating part which symmetry played some centuries later when the Italian influence was becoming paramount in English design. The gatehouse is the most important feature left. This consists of an archway, with a porter's room on each side, the whole being surmounted on the next floor by a large guard-room. There was a drawbridge and a portcullis. The recess into which the former was drawn up and the holes for the chains which raised it are plainly visible. So also are the grooves for the portcullis and the recess in the wall of the guard-room which contained it when elevated. These means of passive resistance were supplemented by others of an active kind, for in the flanking powers are circular orifices, through which the muzzles of cannons were thrust, a method of defence of which there are not many examples to be seen of this date, which is about 1480. The red brickwork is ornamented in places with a diaper of blue; a fashion which became very prevalent during the next century. Among the patterns which a patient scrutiny reveals are the letters "W. H." and a heraldic "manch," the initials and cognizance of William Lord Hastings, who, if tradition can be believed, built the house for the celebrated Jane Shore. It may be so, and in that case the strength of the defensive works seem to indicate that his lordship, having got the lady there, intended to keep her.

Of about the same date, but rather earlier, is

The interesting Manor-house of Stoke Albany.

in Northamptonshire, which, again, is only a small half of the original house. Its principal features are the windows, buttresses and entrance door on the main front. The doorway is a well-moulded pointed opening, surmounted by two shields of arms, the forerunners of the heraldic displays with which the Elizabethan designers loved to adorn their porches.

To the Gothic period belongs also the quaint fireplace of a small farm-house in Somerset called Churchill Park, where the great oak beam is cut to form a flat-pointed

arch and is panelled with quatrefoils and cusps.

The Cause of the Mediaeval Changes never yet explained.

So far, the houses which we have examined have all been Gothic in their treatment. We now come to the period when the influence of the Italian manner began to be felt. The change was gradual, more gradual than that from any one of the preceding styles to the next. The actual causes of the change of style in mediæval times have never yet been thoroughly explained. How was it that within ten or fifteen years the forms given to the ornamental parts of buildings should have altered so completely as to constitute a new and distinct style, and that the change should have affected work over the whole country at the same time? Where was the dictator of fashion located? And how came he, in those days of difficult communication, to influence simultaneously districts so far apart as Yorkshire and Devonshire, Norfolk and Cheshire? Whatever he was—guild or fraternity or society of free-masons—and wherever he existed, his ways were less sudden in the sixteenth century than they were in the thirteenth, for when the foreign forms had found a lodgment in England they were by no means universally adopted, and the old traditional methods of work were retained side by side with the new for thirty or forty years.

The Italianising of English Work

was a slow process. It began in Henry VII.'s tomb, at the instigation of the king, his son, and it was more or less in Court circles that the new mode was practised. One or two houses of the nobility built between the years 1520 and 1530, such as Layer Marney, in Essex, and Sutton Place, in Surrey, were strongly touched with the new influence. But even here the ancient ideas lingered, and Gothic work is to be found side by side with a rendering, more or less faithful, of Italian detail. Sutton Place is a case in point, where the main lines are still Gothic, while the applied ornament is of the Italian type.

At the Vyne, in Hampshire, the paneling which covers the walls has curious new touches about it, and a Gothic-headed doorway is surmounted by a panel of thoroughly Italian feeling.

The same infusion of foreign ideas is to be found in much, though not all, of the work of the first half of the sixteenth century. At Deene Park, in Northamptonshire, for instance, it is visible only in the scrollwork attached to the coat-of-arms of Henry VII. At Clifton Maybank, in Dorset, the beautiful front had much of the new detail, while the bulk of the work was largely English. So fine a piece of work was this front that it was removed and re-erected at Montacute, and the remnant of the house at Clifton has but little of the new fashion about it. It is impossible to look at this house without noticing the bay window high up in the gable—a somewhat unusual position, but one which was copied at Montacute, and this feature serves to remind us what an important part the bay window played in the design of Elizabethan houses.

The Influence on the Masons.

The worthy masons of England were much exercised by the new fashion. Brought up in Gothic traditions, they found themselves compelled to adopt a style of ornament quite strange to them, and of which they did not grasp the underlying principles. Some of them were clever, some were merely honest plodders, and the result of their endeavours sometimes arouses admiration, sometimes amusement, sometimes pity, and sometimes, in unsympathetic breasts, contempt not wholly free from rage. At Dingley, in Northamptonshire, is one of the most curious examples of the good Englishman striving with these puzzling foreign fashions. His arches are

pointed, but they spring from Classic columns, his gables assume strange outlines, and his Classic mouldings are diversified with curious Gothic beads introduced in a manner which would have shocked Palladio.

The Gradual Decrease of Defensive Features.

But we must return from this digression on style to the consideration of the growth of our manor-houses. By the time at which we have now arrived, halfway through the sixteenth century, the fortification of houses had gone out of fashion; there was no longer need for it. Nevertheless, as it was difficult to get rid of old habits, so it was difficult to dispense with old features and old methods of planning. The courtyard idea lingered on long after the need for such a disposition had ceased. But no doubt the desire survived for keeping control over those who went in and out, and therefore the porter's lodge was still retained; and this was flanked in some cases by towers which preserved the appearance of those which in former days defended the gateway of a mediæval castle, although they no longer fulfilled the same functions. But, as time went on, so the defensive precautions grew less, and houses were made more and more cheerful. Windows were made larger, and placed without hesitation on outside walls. Prospect was taken into account, although it did not yet determine the whole position and arrangement of the house: the garden was cared for and laid out with an eye to display; and the whole place was arranged with a view to a quiet peaceful country existence. The development of this side of life may be well traced in such a house as Canons Ashby, in Northamptonshire.

Richness Everywhere.

The prevailing idea of the well-to-do squire was, like Dogberry, to have everything handsome about him. The body of the house was spacious, and in obedience to the custom, now well established, it was usually planned in a symmetrical manner. The walls inside were panelled, the ceilings covered with designs of greater or less intricacy, the chimney-pieces were made large and handsome, the staircases wide and massive. Heraldry was called upon to help in the decoration, and there are very few houses at all well preserved which do not reveal much of their history through the help of this beautiful and fascinating science—or art should it be called?

Detail.

The same general treatment was adopted in all parts of the country, and the result varied according to the nature of the local materials and the skill of the craftsmen employed. In districts such as Lancashire, Yorkshire, and Derbyshire, where the stone is hard, and in Cornwall, where granite was used, the detail is plain. In the Midlands it is often rich and elaborate. The plaster-work is sometimes admirable in design and execution. In remote places it is often puerile. Many of the smaller houses depend for their effect more upon their simple and picturesque outline than upon richness of ornament.

Planning.

Throughout all these years the plan of the house had been of the same type, namely, a large hall as the chief apartment, supplemented by rooms for the family at one end and rooms for the servants at the other. An adaptation of this idea on a small scale may be seen at Cold Ashton, in Gloucestershire, which also retains its forecourt and entrance gateway. The formal arrangement of the approach, even though on a quite small scale, as in this house and at Eyan, in Derbyshire, lends distinction and dignity not to be obtained by a haphazard arrangement.

With the advent of the seventeenth century the Italian influence gained more ground, and began to affect not merely the detail

but the actual disposition of houses; and yet, side by side with this change, there lingered on the methods of fifty years before. At Houghton Conquest, in Bedfordshire, is a house built for the accomplished Countess of Pembroke. This combines mullioned windows with a very pronounced Italian treatment of the loggia: while at Ragdale, in Leicestershire, built by Sir Henry Shirley in 1629-31, is a hall which retains the far simpler treatment reminiscent of Elizabeth's days. In the same county is Stapleford Hall, where at about the same time (1633) William Sherard had rebuilt a wing in which he combined some ancient Gothic niches and statues with the gables and dormers which were characteristic of his own period.

The change towards stricter Italian detail produced many interesting pieces of design, in which it is evident that the mason, although compelled to adopt the prevailing fashion, yet rebelled against giving up his ancient freedom in favour of strict rules, with a result both quaint and interesting. Such is the doorway at Chevey Cant, not far from Bath. The advance of formalism and the change in the disposition of the accommodation of the house may also be seen at Chelvey Court, in Somerset, where there is no longer a central hall but merely an ante-room leading to the living-rooms and the staircase. Here, although the plan has changed from the Elizabethan and Jacobean types, the porch and many of the windows are still of that style.

Formalism

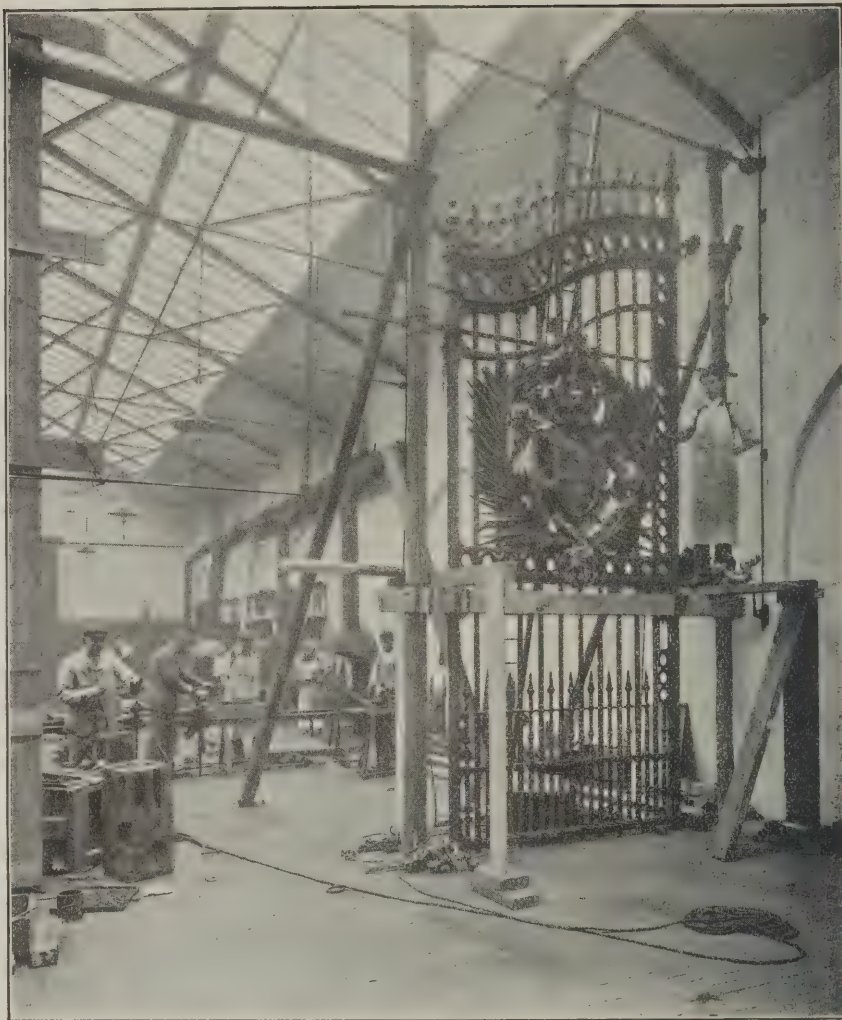
continued to increase as the years went by, especially in the larger houses, but in those of the manor-house type it was restrained chiefly on account of expense, and the simpler forms of the eighteenth-century house are nearly as pleasant to look upon, and harmonize as well with the English landscape, as the mullioned houses of a hundred years earlier. They frequently exhibit a little play of fancy in parts of the design, although in the nature of things the increased deference paid to set rules precluded those unrestricted flights which are so charming a characteristic of earlier and freer days. But if the houses offered less scope for the imagination, the garden gave it a wide range, and we owe to the eighteenth century some of the most charming designs for the surroundings of the house which could be desired. This is not the occasion for pursuing that branch of design at any length, but, broadly speaking, all the most delightful old gardens, with their straight walks, their clipped edges, their statues, lead vases and pleasant summer-houses, were laid out in the early years of the century before last. Not that the seventeenth century neglected this part of the process of making a home—not at all. The Parliamentary surveys of the houses belonging to Charles I. give dry formal descriptions which the imagination can easily expand into the most glowing pictures. Sir William Temple was a great gardener. Numberless examples might be mentioned of splendid lay-outs—Hampton Court, Boughton House, Badminton, Wrest; but these are much vaster in scale than our manor-houses, and many of them have been destroyed. We may fairly say that the high-water mark of beautiful gardening was attained in the first quarter of the eighteenth century.

Such is the account of the old manor-houses of our English counties.

Discussion.

Mr. H. D. Searles-Wood, in proposing a vote of thanks to Mr. Gotch, mentioned the heraldic devices found on old manor-houses, and he expressed regret that there was no handbook which gave them in a succinct form. He thought that such places as Barrington Court should be preserved to the public.

Mr. S. F. Clarkson seconded and Messrs



ONE OF THE NEW GATES FOR BUCKINGHAM PALACE IN THE WORKSHOP OF THE BROMSGROVE GUILD OF APPLIED ARTS AT BROMSGROVE, WORCESTERSHIRE.

John Murray and W. A. Forsyth supported the vote of thanks. Mr. Theo. Moore thought it would be interesting to know whether the planning of the old houses was evolved from small houses upwards or from large houses downwards. He thought in many cases the plan had grown from the nucleus of a hall and kitchen.

Mr. Gotch, in reply, mentioned that Barrington Court was still in the market, but he believed that an effort was being made to raise the necessary money to preserve it to the public. With regard to the development of the manor-houses, he believed they began from a small type and worked upwards. The early houses consisted of a hall with a private room at one end and the servants' quarters at the other. The plan was gradually extended at each end, and so, as time went by, developed into the courtyard plan. He did not think so much attention was paid to appearances, but the old builders built constructionally and, as often happened, this resulted in something beautiful.

BAALBEC.

IN the course of a lecture on Baalbec which he delivered recently before the Bradford Scientific Association Mr. E. Naylor said the city was the site of a very early city, though no scrap of reliable history in regard to it existed prior to the Roman invasion. According, however, to the local tradition, Adam, Abel, Seth, Noah and Shem were all buried within a short distance of Baalbec. Under the Romans the city was known as Heliopolis. The sole attraction of the city to the visitor lay in its possession of the ruins of a marvellous series of temples,

which covered 15 acres of land. These temples were built probably during the first three centuries of the Christian era, and were of enormous size, but with such excellence of proportion that it was only when one began to measure them that the full magnitude was realized. The great feature was the so-called cyclopean masonry of one of the great temples, which included two courses of immense stones. Three of the stones which Mr. Naylor measured were respectively 62ft., 61ft. and 63ft. long, while they were 14ft. wide and 12ft. in height as they lay in the wall. Another temple presented a colonnade of six columns which, with their base and their entablature, were almost exactly the height from the ground to the centre of the clock of the Bradford Town Hall. In another part of the buildings two landings and steps of a staircase were carved through the middle of a solid cube of stone roft, in each of its dimensions. This was placed by the builders, not on the ground level, but at the top of a staircase between 60ft. and 70ft. high. The builders, in fact, seemed to have delighted in making difficulties and overcoming them. The stone had evidently been quarried a mile or so from the spot, and in the quarries there lay one stone evidently intended for the building, though it was not fully separated from the parent rock. This stone was 70ft. long, and varied in width from 14ft. to 70ft.; it was 14ft. in height. Such a stone, if it could be placed on end and hollowed out, would make a cottage of the floor dimensions ordinarily adopted, and seven storeys in height! Into speculations as to the means by which the old builders continued to deal with such enormous masses of stone Mr. Naylor declined to enter.

THE MERITS OF GLAZED WORK.

TERRA-COTTA has not yet reached its highest development. Architects have been deterred from using it by the imperfections of its early manufacture, such as hot hard colours, the irregularity of shape and size resulting from the burning, the opportunity which the surface gave for the accumulation of dirt in smoky town atmospheres, and the chance of its crumbling in atmospheres charged with chemicals, or at seaside towns, unless thoroughly vitrified throughout.

The manufacture of terra-cotta has progressed, and it is now a much more satisfactory material. Various surface textures have been given it in order to overcome the liability to collect dirt, while better manufacture has overcome the crumbling tendency in strong or impure atmospheres; also the manufacture has greatly overcome the warped and twisted surfaces that were formerly obtained. Terra-cotta has many advantages which should have brought it into greater favour, and there is another important recent development that has produced a form which appears to be the most suitable material for the majority of commercial buildings in cities, namely, glazed terra-cotta or faience. The latter word was formerly applied only to the modelled and coloured glazed terra-cotta known as Robbia ware, the most noted examples of which were the works of the Della Robbia family in Italy, world-famous in art history. These, however, were only produced in small pieces, and never on a commercial scale; and it is only within the last few years that we have been able to obtain sufficient quantities to bring faience forward as a building material pure and simple. Now the manufacture is not limited to modelled work but applies to plain or simply moulded blocks in architectural form suitable for encasing steelwork or to be backed by bricks in the same way as stone.

By reason of the improvements in manufacture, blocks of glazed terra-cotta can now be produced in sizes as large as stone, so that the detailing is much the same, and the jointing can be suited to any desired scale.

The advantages of cleanliness which a glazed surface possesses are apparent. The surface must of course be a lasting one and free from serious imperfections, just as with glazed bricks no glaze can be tolerated which

cracks or crazes, because then, even if the frost does not splinter the glaze from the body, moisture will carry dirt into the cracks and under the surface and produce a bad effect.

Glazed terra-cotta is now made in a wide range of colours, perhaps the most serviceable for external purposes being the lighter tints, such as white or cream and light-blue or green, because of their bright and cleanly appearance, but fine polychromatic effects may be obtained by the judicious blending of colours. The softest and most delicate tints can be obtained from the best manufacturers. For interior work in offices the lighter tints are equally valuable, but as there is often sufficient light available from

windows the darker colourings can be used more readily than for exterior purposes and great richness of treatment can be indulged in. The many advantages outweigh the objection which has been raised by some architects to the sheen of the glazed surface.

Faience can be combined with glazed bricks. In fact, where, of necessity, these latter are used in a building, it seems out of place to combine any other material than glazed terra-cotta with them.

One of the most important buildings that has been executed primarily in glazed material is the head office of the Prudential Assurance Company, Ltd., at Holborn Bars, London. The elevations of the newer and larger portion of the building had, of course,



PRINCIPAL STAIRS AT FIRST-FLOOR LANDING, PRUDENTIAL ASSURANCE BUILDING, LONDON: SHOWING BURMANTOFTS FAIENCE; TILES AND GLAZED BRICKWORK.

to conform with the first block erected many years ago, and therefore red terra-cotta and bricks of terra-cotta clay have been employed for the external elevations. In the interior, however, glazed bricks and terra-cotta have been exclusively used for the surfaces, ceilings being in many cases no exception. The late Mr. Alfred Waterhouse, R.A., particularly favoured terra-cotta in his buildings, and in this building of the Prudential Co., with the completion of which his son, Mr. Paul Waterhouse, F.R.I.B.A., had so much to do, the use was extended beyond his early works.

On the preceding page we give an interior view showing the use of glazed terra-cotta with glazed bricks, demonstrating the possibilities in this direction. The fan vaulting to be seen is all of glazed terra-cotta. The many barrel and Gothic rib-vaulted ceilings, it will be understood, require special care and attention in the manufacture, and they show the exactitude possible under modern processes of manufacture.

An interesting pamphlet has just been published by the Leeds Fireclay Co. (whose Burmantofts works carried out the scheme in the Prudential Co.'s offices) containing many illustrations of their work in the building. Of course, the colour schemes cannot be shown in photographs; the colours of some parts are brown, running into light fawns, with delicate tints of ivory and blue, while in others greens merge into green-greys, with either the ground or ornament relieved by a delicate tint of colour.

The Burmantofts works supplied nearly three millions of glazed bricks for this building; in many rooms they form the decoration alone, patterns being made with different coloured bricks.

This branch of the Leeds Fireclay Co. has a great advantage by reason of the fact that it is able to produce all the glazed work for a building of such large size, which enables the whole of an architect's design to be controlled and carried out from one source, so avoiding many mistakes and eyesores which are often so apparent where such work has to be assembled from many sources.

Keystones.

Mr. Herbert Goodman, A.R.I.B.A., has removed to new offices at 53, New Broad Street, London, E.C.

A new Lighthouse has been erected on the extremity of Portland Bill, and will be opened in January. The lantern will be of 255,750 c.p.

Change of Address.—Owing to increase of business the Spottiswoode Advertising Agency, Ltd., have removed to larger and more commodious premises at Oswaldestre House, 34, Norfolk Street, Strand, W.C.

Great Queen Street Chapel has been acquired by the Wesleyan West London Mission. Plans have been prepared for the conversion of the building into a central mission-hall to seat 2,000 persons. The total outlay is estimated at £25,000.

Proposed new Pier at Hull.—The Hull Corporation Markets Committee have approved a scheme for the erection of a new pier, to facilitate the landing of fruit and other goods at all states of the tides of the Humber. The scheme is estimated to cost £215,000.

St. Peter's Church, Dorchester.—The restoration of this church has now been completed. The tower, which contains a peal of eight bells, has been repaired by Messrs. Meyrick & Son, of Glastonbury, under the direction of Mr. Caröe, and the roof of the fabric has been renovated according to the plans of the diocesan architect, Mr. Ponting, of Marlborough. The total cost of the work has been about £1,700.

A new Conservative Club at Brampton, Carlisle, has been built by Mr. J. Heward from designs by Mr. Taylor Scott, architect, of Carlisle, at a cost of £900.

Reconstruction of Buildings in Princes Street, Edinburgh.—Nos. 26 to 30, Princes Street, Edinburgh, are to be reconstructed for Messrs. R. W. Forsyth, Ltd., outfitters, by Mr. J. J. Burnet, A.R.S.A.

Abergwili Palace, the residence of the Bishop of St. David's, has been rebuilt after the fire which occurred there in April, 1903. The work has been carried out at a cost of £13,000 from designs by Mr. W. D. Caröe, the builders being Messrs. A. Turner & Sons, of Cardiff.

New Inland Revenue Offices at Cardiff have just been completed at a cost of £20,000. The architect was Mr. H. N. Hawks, I.S.O., of H.M. Office of Works, the contractor being Mr. James Allen. The work was carried out under the supervision of Mr. Thomas.

Surveyors' Institution.—At last week's opening meeting of the session Mr. Charles Bidwell delivered his presidential address. It was announced that the council's gold medal for the best paper read during the past session had been awarded to Mr. E. Morten, barrister-at-law, for his paper on "Surveyors' Reports and Certificates."

"Office Towers."—The suggestion for the erection of "office towers" which we made in our issue for last week has attracted considerable attention in the daily press, but we notice the idea has been enlarged into meaning "skyscrapers." That, of course, was not the idea set forth in these columns. It is evident, however, that the need for better ventilated and better lighted offices is widely recognized.

Proposed Work on "Architectural Refinements."—The Edinburgh Architectural Association, in conjunction with the Brooklyn (U.S.A.) Museum of Arts and Sciences, in response to a generally expressed desire, propose to publish a permanent record of the architectural refinements exhibition recently held in Edinburgh. The record will be in the form of a volume comprising 250 plates in 10 vols. printed on paper 15 ins. by 11 ins., with notes and descriptions by Professor Goodyear. The book will, if published, be brought out by Mr. B. T. Batsford, the well-known architectural publisher of London. It is considered unlikely that the published price can be less than £5 nett, but the Edinburgh Architectural Association invite such support as will warrant them in putting the preparation of the work in hand, and of giving to the members and friends of the Association some advantage in subscribing for copies at the special reduced price of £4 4s. The issue of the volume might be looked for early next summer. Applications should be made to Mr. Ingleby Wood, hon. exhibition secretary, Edinburgh Architectural Association, 122, George Street, Edinburgh, before December 1st.

The Leeds and Yorkshire Architectural Society held its opening meeting of the session last Thursday, when Mr. G. Betram Bulmer delivered his presidential address. It was usual, he said, to give some account of the important buildings of the year, but he regretted to say that within the city there was little to mention. The completion of many important works last year and the stagnant condition of trade at the present time accounted for this. Turning to the amenities of the city, he urged that some action should be taken against the advertising fiend, who had planted his boards and letters everywhere. This growing nuisance should be controlled, and town and country authorities should have more power to deal with transgressors. Owners of property also could

assist by prohibiting their tenants from defacing buildings with sign-boards and prominent lettering, confining all privileges in this direction within strict limits. Alluding to the desire for the clean and cheerful aspect of streets, Mr. Bulmer instanced the use of cleansable material, such as hard bricks and terra-cotta, of which there were two examples in Leeds that periodically renewed their pristine beauty, and would continue to do so for years to come, by the application of water supplied by a hose-pipe. Unfortunately terra-cotta lent itself so readily to the repetition of ornament that there was danger of making designs too elaborate, and the multiplication of ornamental features made the cleansing process more difficult. Therefore we should aim at plain wall-surfaces, with high-class decoration sparingly used.

Builders' Notes.

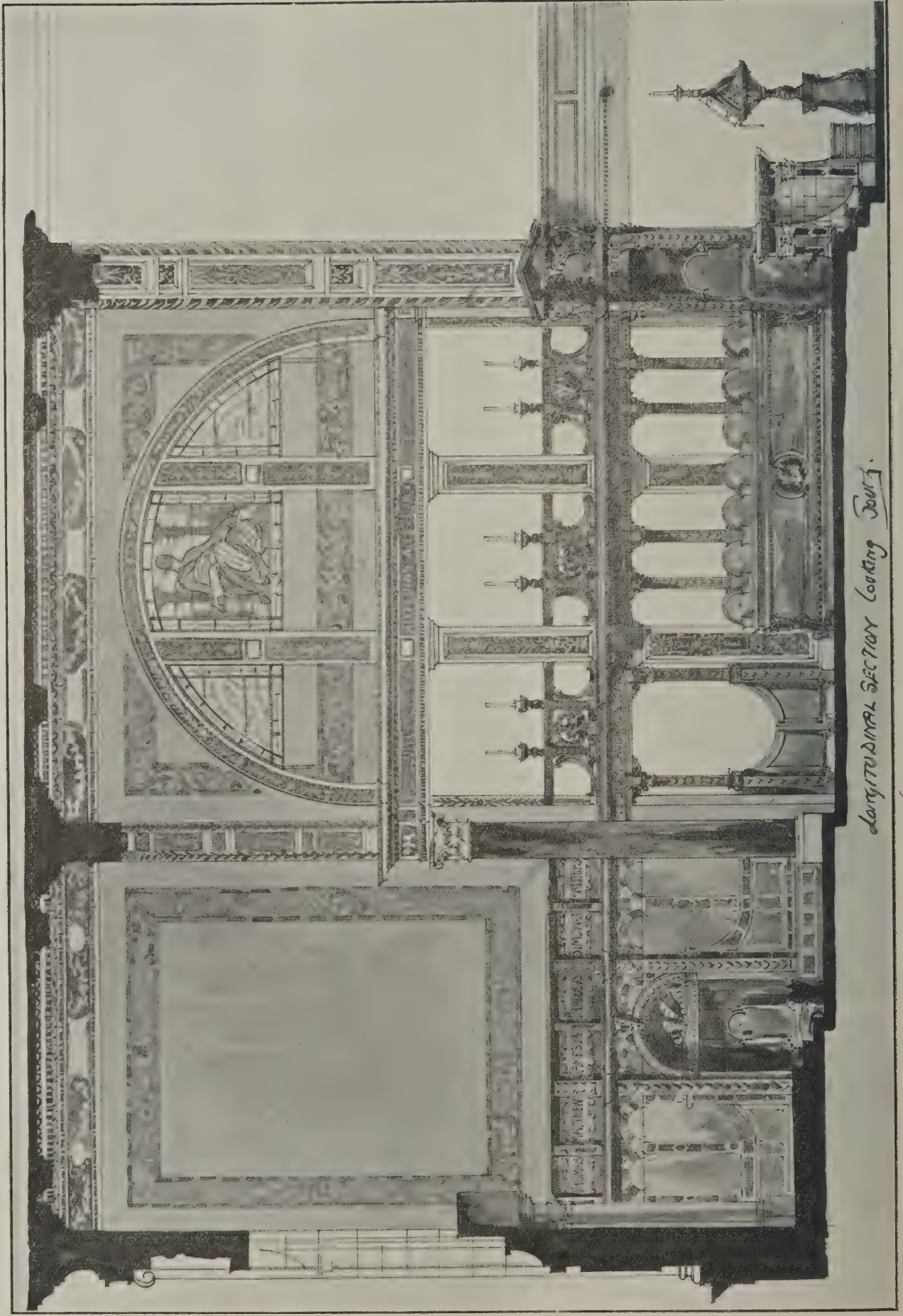
Preston Savings Bank.—The constructional steelwork, fireproof floors, wood-block flooring and asphalt flat roofs of this new building, in course of erection from designs by Mr. Thwaites, are being carried out by Messrs. Homan & Rodgers, of 10, Marsden Street, Manchester.

Birmingham Master-Builders' Association.—The annual meeting and the annual dinner of the Birmingham Master-Builders' Association was held last week, Lieut.-Colonel Barnsley presiding. The annual report stated that a deputation from the Association had waited on the Corporation Water Committee to urge the importance of supplying quantities when inviting tenders for work of any magnitude. With regard to the questions of wages and hours of labour, a set of rules had been agreed to by the members of the National Federation and the various societies of operative masons, carpenters and bricklayers for the establishment and government of conciliation boards in the building trades, with a view to obtaining an amicable settlement of disputes without resorting to strikes or lock-outs; and the Association had arranged with the above-mentioned branches of the trade for these rules to apply in Birmingham. Lieut.-Colonel Barnsley, referring to the depression in trade, said that not for at any rate thirty years past had the building trade generally been so depressed, and it had been especially so during the past year. He noticed, however, there were signs of increased activity among manufacturers, though that might not affect them for some little time to come; for it was always a year, and sometimes two years, in the case of a revival of trade before they saw any corresponding activity and revival in the building trade. They had not given any notice to operatives this year for a reduction of wages. They believed their Association did not exist for that purpose. Though the committee felt the condition of trade quite warranted coming to a reduction, yet they were always reluctant to make any suggestion of that kind, and felt at any rate they should see for another year what the outcome of the present rate of wages would be.

OUR PLATES.

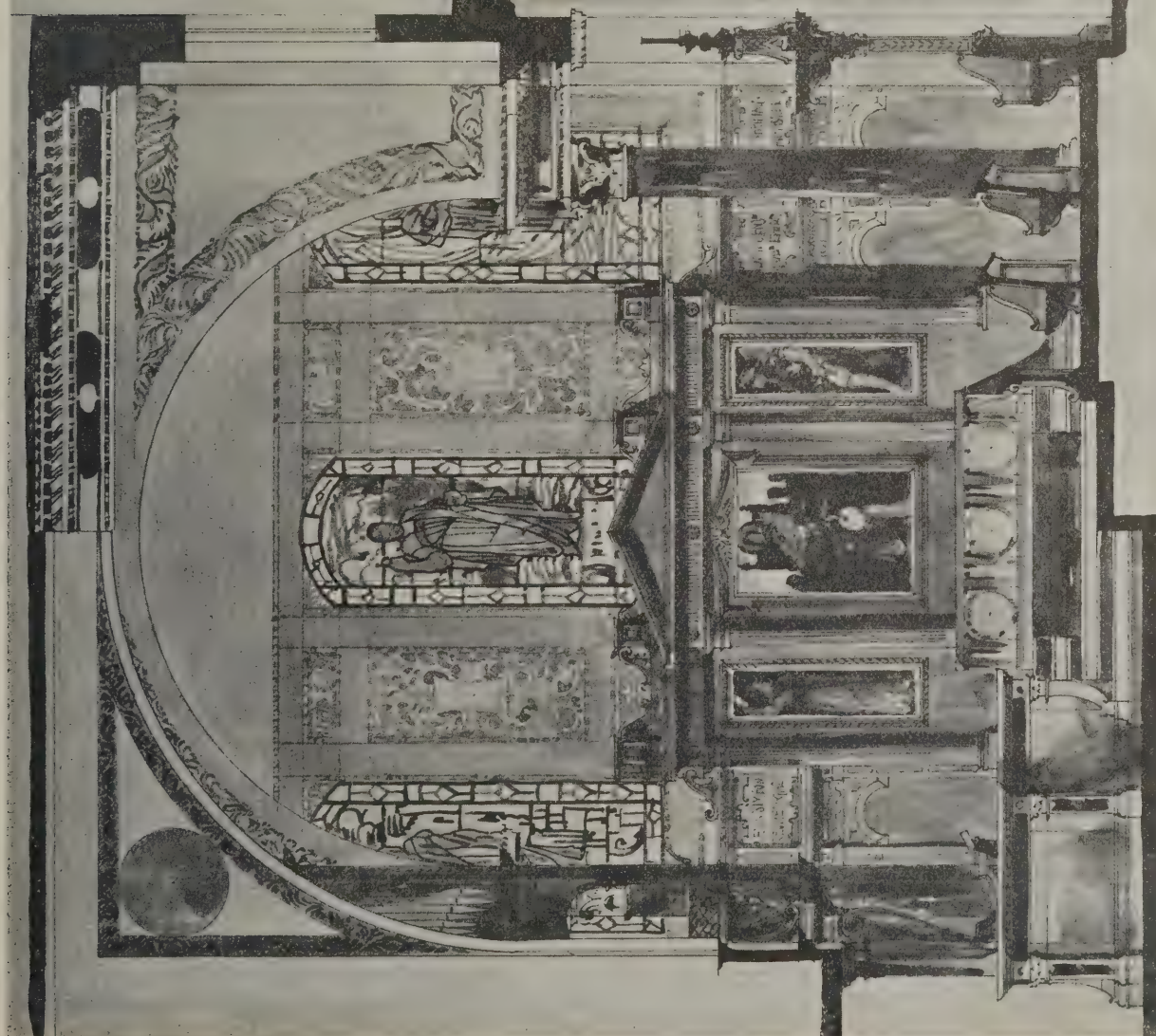
THE scheme of colour decoration for the new chancel of Clapham Parish Church, shown in Prof. Beresford Pite's Academy drawings, is not yet carried out, though the structural work was completed about a year ago. The old reredos was refixed, as well as the former choir stalls, pending this complete scheme of decoration. The scheme is very harmonious in colour, soft greens and blues being predominant.

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LONGITUDINAL SECTION LOOKING SOUTH.

CLAPHAM PARISH CHURCH
 Scheme for Decoration of Chancel.
 1/4" scale. *Wm. R. Pitt*
 1905.



SCHEME FOR THE DECORATION OF THE CHANCEL OF CLAPHAM PARISH CHURCH. PROF. BERESFORD PITE, ARCHITECT. (Royal Academy Exhibition, 1905.)

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NEW COTTON MILLS.

(By our Manchester Correspondent.)

AFTER a period of deep depression the Lancashire cotton trade is reviving briskly, and new mills are springing up like mushrooms. At the beginning of July forty-eight mills, containing four million spindles, were just opened, in course of erection or projected, all the companies being registered. To build and equip these mills it is estimated that £5,000,000 will be required and that work will be found for 10,000 operatives. Additions to this list are being made almost weekly.

Unfortunately this great movement is not so much direct help to the building trade as the figures appear to suggest, though full of promise for the general trade of the district. The mills, of course, are mere shells, with little internal builders' work. Moreover, the companies are formed upon a joint-stock principle which has little to learn from even Yankee astuteness. In very many cases the various contractors form the major part of the initial concern, and builders, machinists, engineers—even the merchants who supply belting and sundries—are all more or less paid in shares, the working capital being mainly found by the operatives. A significant fact is that in any description of a new mill the architect's name is seldom given. Yet these immense buildings furnish no mean opportunity for the display of really good architecture, and in many cases a simple treatment, with bold outlines and good proportions, has resulted in fine elevations—which are possibly quite lost upon the matter-of-fact shareholders. The one new feature in these mills is an experiment towards electric driving. At Pendlebury a cotton mill containing 80,000 spindles is running, driven entirely by electric motors, the current being taken from a public power station. This is the first cotton mill in the country so driven. In another case—Messrs. Ashworth, Hadwen & Co.'s Droylsden mill—electric transmission is being substituted for shafting, and the generators are to be driven by steam turbines. It is stated that a syndicate formed to erect new mills in Macclesfield and other towns proposes to use gas-producer plants and gas-engines.

All this means a great breaking away from old traditions. Hitherto a cotton mill, with its regular and heavy load—running up to 1,000 or 1,200 horse-power—has been considered a typical steam-engine drive. The new departure will be watched with great interest.

Gas producer Plant for Builders.

The power used by builders, is so small relatively that any comparison with a large mill would be absurd. It may be stated, however, that two firms in this district have found electric driving terribly expensive, though the intermittent running of builders' machinery should suit electric motors perfectly. On the other hand, the gas-producer plant is rapidly winning favour. Indeed, there can be little doubt that for moderate loads—say from 20 to 200 horse-power—this form of energy has an immense future. The two advantages of the plant are the low cost of fuel and the little attention required. It is claimed, that under ordinary working conditions, power may be produced at from $\frac{1}{2}$ d. to $\frac{1}{4}$ d. per brake-horse-power hour, according to the size of the engine, these amounts including maintenance, depreciation and interest. As a case in point, a Manchester contractor is driving a 100-b.h.p. load at a cost of about 25s. per week for fuel. He states that ten minutes at starting and a few minutes at intervals during the day is all the attention required by the plant. "In fact," the foreman said, "we scarcely know that we have an engine running." But with gas-producer plants, as with gas-engines, the true economy is to buy only makes of proved excellence.

Correspondence.

Foreign Fireproof Floors.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—A question of considerable importance to architects is raised by some newspaper correspondence as to the specific materials adopted in the construction of the fireproof floors in buildings on Crown property. It is stated that the fireproof constructional work has been given to a foreign firm and that, considering the number of unemployed at the present time, an injustice has been done to the British working man.

I think that such a charge, which is incorrect, should not in the interests of the architectural profession be allowed to pass unchallenged. I understand the materials used, although imported from Italy, are fixed by trades-union bricklayers and labourers, that the steelwork and concrete is of English manufacture, and that the agents in this country are Englishmen. If an architect, after considering the cost, strength and fire- and sound-resisting qualities of various materials used in the construction of a floor, decides in favour of a material of foreign importation, would he be justified in discarding it solely from the fiscal point of view? Then again, were it found that this material was considerably cheaper than that of English production, would he be studying the interests of his client by favouring home industries?

I think the profession generally will agree it is the duty of an architect to obtain for his client materials in the cheapest market that will best meet all requirements. If the profession is to be dictated to by the British working man, we shall next hear that it is not to specify marble, terrazzo, asphalt or even timber because it is not English and in many cases is executed with foreign labour.

There are two ways of looking at most things, and this seems to be the case with regard to the matter under discussion. I feel sure it will be the opinion of readers that the question of materials specified, whether of English or foreign manufacture, should be left entirely to the discretion of the architect responsible for a building.—Yours truly,
LONDON. A. C. F.

[We publish the above as a matter of interest to architects and builders; but, of course, our correspondent's opinions are not necessarily our own.—Ed. B.J.]

The Reform of Architectural Competitions.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I am glad to see by the recent articles in your journal that you propose to take up the question of competitions with the object of improving the conditions under which they are carried on. I notice that you refer to two causes of complaint—the ignorance or bad faith of promoters, and assessors; but you do not mention the third—the ignorance or bad faith of the competitors themselves. Ought not this to claim your equal attention?

While everyone who has thought much about the matter realizes (or so it seems to me) that the root of the trouble lies far deeper than any question of mere mismanagement, and is to be found rather in the bad and unsystematic education of the architect, with its resultant ignorance of and difference of opinion about the fundamental principles of architecture and the qualities which distinguish a fine design—the righting of which must be a matter of time and slow development—yet surely there are certain reforms in management which might be considered by all to come within the area of practical politics.

To me the most urgent question of practical reform at this present moment is the need of a jury in the place of a single assessor—to which I notice you refer—and I believe that

in saying this I am only giving expression to general opinion.

It is impossible to point out in a short letter all the arguments in favour of this reform, and all the other improvements which I feel sure would incidentally grow out of it. I can only commend it to you as a matter of the first importance, calling for immediate attention, and as a reform which I am convinced will have a far-reaching influence for good.—Yours truly,

WESTMINSTER.

A. R. JEMMETT.

NOTES ON COMPETITIONS.

An Elgin Competition.

REGARDING our references to the Elgin Cemetery Extensions Competition, we have received the following letters:—

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Your issue of November 8th and the article therein, "Two more Unsatisfactory Competitions," has been brought under our notice. With regard to your remarks on the competitive plans for the extension of the Elgin Cemetery, we have to state that the competitive plans were submitted to a professional assessor and reported on, and the design was selected before the envelopes containing the names of the competitors were opened; further, the design was selected without any knowledge on the part of the committee of who the author was. The plan selected was afterwards considered by the committee and their own architect, and certain alterations made thereon, but these alterations were irrespective altogether of any ideas contained in the other plans. We are not aware that it is necessary to submit such plans for the ultimate decision or criticism of "The Builder" or any other newspaper, and it is, we consider, unnecessary and very inconvenient to do so. We will expect this letter to appear in your paper as an answer to your article.—Yours truly,

ELGIN.

STEWART & McISAAC.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—As a reader of your paper for many years I regret to find that you have been so misled about the competitive plans for the above. In justice to the committee I beg to give you the following information:—(1) When the plans for the new extension were under consideration the committee wished to give local men, as ratepayers, an opportunity of competing, and accordingly, after preparing a memorandum of conditions, advertised the competition in the local papers. (2) The memorandum of conditions contained the following clause: "The Cemetery Committee will adjudicate upon and select the best plan for their purpose, and will take the advice and assistance of a qualified assessor in doing so" . . . "The works are to be carried out by the committee under their own architect, and the committee reserve right to make such alterations on the plans selected as to them may appear necessary" (3) On the designs being submitted, I was asked by the committee, as their own architect, to go over the three most likely ones, independently, preparing a report on the relative cost of each on a common basis, and a few notes on their suitability for the purpose. (4) This report was laid before the committee together with the designs, and after careful consideration the design marked "Moray" was unanimously selected, the author's name being only ascertained after the envelope containing his card had been opened. (5) Immediately the selected design had been fixed upon, the secretaries were instructed to pay the premium, and, after ascertaining the authors' names and addresses, to return the whole of the others.

Personally I am pleased to assure you that no unfair advantage was taken of the designs

submitted by any other than the successful competitor. I hope these explanations will modify the views expressed in your leader, although doubtless it may never come under the notice of any of the parties interested.—I am, yours truly,

JOHN WITTET,
Elgin. Architect and Surveyor.

[The information which we published was furnished by Messrs. Stewart & McIsaac, solicitors, secretaries to the committee, in reply to a letter from us asking (1) for the names of the architects placed first, second and third; (2) whether the designs were to be on exhibition, and if so the date of this exhibition, so that our representative might have an opportunity of seeing the designs with the object of criticizing them; and (3) for a copy of the conditions for use in connection therewith. The reply from Messrs. Stewart & McIsaac stated: "The prize for the competition was awarded to William C. Reid, architect, Elgin. The design is under consideration with a view to alterations on it, and we do not think that the committee will care to have it criticized." Nothing is said as to any other architect being employed or as to any exhibition of designs having been held, and no copy of the conditions was sent; nor were we furnished with any information which would have allayed suspicions likely to be aroused by such a letter. Even now the firm of solicitors does not furnish the name of the professional assessor; though the knowledge that he was the committee's architect is afforded by our other correspondent. As regards the other remarks contained in the firm's letter, when a public appeal is made through the newspapers it is generally reckoned that the press and public have a right morally, if not legally, to an opportunity of obtaining a knowledge of the facts. Whether the competitors were able to see the designs submitted we do not know. Mr. Wittet provides more information. Apparently from his statement the committee did not desire to obtain ideas, but just to give local men as ratepayers the opportunity of joining in a competition. They had their own preconceived ideas, we learn, by which they modified the accepted design, and it seems to us illogical for them not to have gone further and appointed the successful ratepayer to carry out the work. Whereas the committee's solicitors state that an assessor was employed, the committee's architect says that he only reported on the designs and that the committee, after careful consideration, unanimously selected a design. Our readers can draw their own conclusions from the facts above stated.—Ed. B.J.]

Preston Schools Competition.

[1st (£50), Woolfall & Eccles, Liverpool; 2nd (£30), Alfred E. Corbett, Manchester; 3rd (£20), Charles B. Pearson, Lancaster.]

In reference to this competition we have received the following letter from a well-known Manchester architect:—

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Believing you are taking more than ordinary interest in the evils of many public competitions, I take the liberty of bringing before your notice the decision in the competition for a secondary school at Preston limited to architects of Lancashire. The evil to me is that the assessor has failed considerably in his judgment, and although there are several very good plans he has chosen the first three from what I should consider very inferior results. Several competitors, together with myself, are thinking of protesting in some combined form, as we strongly feel this wrong decision. The plans are open to the public until the end of this month, and the names of the competitors

are affixed to the drawings. The assessor I understand is local.—Yours truly, X.

Having regard to the eminent source of the information received, it seems that this is still another instance where the judgment of the assessor has been at fault.

It is to be hoped the protest of competing architects referred to by our correspondent will not be in vain. We shall be pleased to put any competitors into communication with our correspondent. Cases of this nature are occurring with such frequency that it is time the whole system governing the conduct of competitions was looked into very thoroughly with the object of devising some method whereby the regrettable results to which attention has lately been directed in these columns may be prevented. In all fairness, it must be conceded that promoters are not always to blame. In fact, they are often in as unenviable a position as the competitors themselves. Could they not in many instances retaliate upon objecting competitors as follows: "We have based our conditions upon recognized standards, we have obtained the services of a professional assessor, we have agreed to abide by that assessor's award, you have taken no exception to his appointment but have sent in your designs, whereby we were confirmed in our opinion that he was a suitable person for the position, and now you are dissatisfied with his award. What are we to do—adjudge the designs ourselves, allow you to do so, or put ourselves to the expense of engaging another assessor?" Competitors themselves are greatly to be blamed; leaving the case of Preston out of the question, they are often only too ready to rush into competitions regardless of the ability of the assessor and the quality of the conditions; they lack *esprit de corps*, as is evidenced by their unwillingness to come forward and protest in a body when flagrant injustice has been done to their own or their fellow-competitors' designs, by the mistrust with which they view the efforts of any society promoted for the purpose of battling with abuses, thereby crippling that society's power for working good, and neglecting their own opportunities for becoming one of a mighty combination which should possess the power over life and death as regards competitions. But for a millennium it seems useless to hope, and other methods must be sought for the mitigation of present evils. The great thing to be realized is this, that no matter how carefully assessors are chosen they may be liable, being but human, to an occasional error of judgment. To provide for such a contingency it ought to be possible to organize a body, preferably in connection with the R.I.B.A., of architects of repute to which an appeal against an assessor's decision could be made by a definite proportion of the competitors, such body to exist for the purpose of dealing with the appeal, considering the designs, making a fresh award, or affirming the assessor's decision. It is hoped to deal at greater length with this suggestion at a later date.

Proposed Extension of Birmingham's Council House.

Let all competing architects who are deploring the present dearth of anything worth "going for" take hope and stifle the sighs which rise at thoughts of the well-fought battles of Hull and Westminster, for there are great doings at Birmingham, where a field of battle is being prepared in the vicinity of Edmund Street, Concreve Street and Margaret Street. Next Tuesday, November 28th, the Council is to meet and consider a report which will be presented by the General Purposes Committee stating the particulars of the accommodation which will be required by the several Corporation departments, upon which matter they have obtained the advice of the Corporation's consulting architects, Messrs. Aston Webb & Ingress Bell.

The scheme provides for the accommodation of the Gas Department with an extension of the Art Gallery upon an upper floor at an estimated cost of £74,000, Tramways Department £15,000, and other departments £48,000, making a total proposed expenditure of £137,000. The consulting architects recommend that preliminary sketch plans be invited, from which not less than six nor more than ten be selected, the authors of such selected designs to submit others in a final competition, for which they should each receive 100 guineas. From the final designs the best will be selected by the consulting architects in consultation with the committee. Suggestions are made as to how the competition should be conducted, and these are all sound. The committee are in favour of the architects' recommendations, and are applying for authority to obtain plans in accordance therewith. It is intended that the sketch designs shall be sent in by March 31st next.

New Premises for the Royal Institute of British Architects.

"We, the undersigned members of the Institute, having learned from the president's address delivered on the 6th instant that the R.I.B.A. is about to erect a new building for its own use, feel that an opportunity of designing this should be open to all its members. In the event of this opportunity being afforded, we suggest that a competition should be held and its conditions based on the 'Regulations for Architectural Competitions,' and that the members should select a jury of three assessors by vote." Such is the wording of a petition which was delivered to the secretary of the Institute on Monday (November 20th) bearing about 150 signatures of members of the R.I.B.A. in London, Liverpool, Birmingham, Manchester, Leeds, Cardiff, Nottingham, Leicester, Plymouth, &c.; a remarkable number of signatures in view of the short time allowed for obtaining them—four days. The R.I.B.A. charter and by-laws require that questions affecting the property of the Institute be subject to a resolution of a general meeting. No doubt a special general meeting will be called in due course. It ought to be productive of some interesting discussion.

Swansea Competition.

We have received the following communication from a correspondent: "For an especial piece of competition cheek I beg to draw your attention to the Swansea Corporation Housing Scheme, 1905. I am unable to send you the particulars, as they only came to me indirectly. These gentlemen require builders (and possibly architects) to submit plans, specifications and tenders for about twenty-eight houses. There are no stipulations as to cost, accommodation, premiums or assessor, and they will not be responsible for any expenses incurred in preparing the scheme, nor will the lowest or any tender necessarily be accepted. A significant clause is that builders will be required to pay the trade-union rate of wages. These gentlemen, who desire to obtain ideas and designs for nothing, are extremely anxious that the workmen should be fairly paid. And why? From humanitarian motives? Not a bit of it. But because the workmen have had the sense to combine and demand fair treatment. How soon will the profession cease to whine and commence to hit?"

New Municipal Buildings, Dartmouth.

For the proposed guildhall, municipal offices and markets at Dartmouth thirty-seven sets of drawings were received by the borough surveyor (Mr. Arthur Smith), and after careful consideration the town council has awarded the premiums as follows:—First (£50), No. 108, Mr. R. Montague Luke, C.E., architect and surveyor, Plymouth; second (£30), No. 11, Mr. Horace T. Bonner, A.R.I.B.A., C.E.,

architect and surveyor, London; third (£20), No. 132, Messrs. Bridgman & Bridgman, F.R.I.B.A., M.S.A., architects and surveyors, Torquay and Paignton. The designs were exhibited in the Market Hall last week. Mr. Luke's elevations are in a somewhat free treatment of the eighteenth-century Renaissance, in Devonshire limestone. The nautical associations of the town are expressed in all the sculptured ornament, and on the façade are bas-reliefs representing admirals who may have been connected with the town's past history, while other sculpture illustrates its naval history. The skyline of the front is broken by a central dome supporting a clock turret. At the sides are two angle turrets. On either side of the dome-lighted entrance hall are the municipal offices, and above these the council-chamber, mayor's parlour and guildhall, whilst the main staircase leads directly through a crush hall to the town hall. From either side street are entrances to the meat and general produce market and the butter and poultry market, each covered with glass roofs and connected by a covered way. Entered from the Market Square and entirely separate are the fish markets, office and weigh-house, also the fire-engine department, over which are the dressing-rooms to the stage of the hall. Provision is made for cold storage underneath the hall.

R.I.B.A.

Mr. Denell on American Methods of Erecting Buildings.

A MEETING of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the president (Mr. John Belcher, A.R.A.) occupying the chair.

Mr. R. A. Denell, managing director of the Waring White Building Co., Ltd., read a paper on "American Methods of Erecting Buildings." In his opening remarks the author referred to the increase of rapidity of construction and economy as being the dominant factors in the consideration of the subject. American contractors are generally good business men, and apply business principles to their affairs. They try to make every man in their employ responsible in his own position or sphere, advancing him when he shows capabilities to trust his own judgment and to go ahead alone successfully. The best builders in America, as a general rule, have served a large portion of their apprenticeship in architects' offices, and this has resulted in a better understanding of the architects' ideals and demands.

Careless of Labour.

We get careless of our labour here because of its cheapness; were it more expensive we should watch over it more and give it better supervision. The best American contractors never allow more than twenty-five men to work without a foreman, the result being that he sees that they work and, what is more important, that the work is planned out for them in advance, and that their materials will be ready as wanted. One of the chief reasons for the rapidity of construction in large buildings in America is the way in which materials are dealt with. Time being an essential factor, it would be impossible for a contractor there to execute joinery, stonework, marble work and ornamental plastering so efficiently or so well with his own plant and in his own shops as each man in his own particular trade who has made it a speciality and has had lifelong experience in it. Such work as steel, terra-cotta, partitions and mechanical plant is manufactured by much larger firms than here, and can therefore be supplied much more quickly. The builder stands, however, between the architect and the specialists,

seeing that the material is correct in quality and workmanship, and is being worked carefully to details, and also that it is being advanced so as to be ready at the proper time to fit in with the other work.

Remuneration of Architects.

Coming to the larger aspect of the subject, the author observed that the difference in the methods of construction in American practice is the result of evolution in response to certain conditions, climatic and economic, and public demand. The predominating client being practical and commercial, his demands are those that result in the greatest financial benefit to himself, such as speed, economy in construction, greatest available space to let, &c. The remuneration of American architects is the same as here; but for this much more work is required, more detail drawings having to be furnished, and no assistance from clerks of works or quantity surveyors being afforded. In America the quantity surveyor is unknown. The time given to builders in which to estimate is rarely over a fortnight, and each builder keeps his own staff of estimators. If consulting mechanical, sanitary and structural steel engineers are required, they are generally employed by the architect; and to avoid the expense of this many architects have these engineers on their office staff. This would only be remunerative when a large amount of work was done annually—in the case, for instance, of men who deal with the largest work, amounting to from one to four millions sterling per annum. In some cases an architect's establishment costs would be about £50,000 a year.

Authorities in the States.

In America each city has its own building department, which is the only authority to be consulted. Before starting work plans must be filed and approved, after which, except for variations, &c., one can proceed without further interference if following plans which have been filed. The larger cities have a competent staff to deal with building works; and also an engineering staff to calculate the strength of the various parts from the drawings, so as to see that they conform to the by-laws and are structurally safe, and thus prevent "jerry" building, &c. Again, each city has its land surveyors, who at once, upon notification, fix according to law, and to deed and title, the exact boundaries of your client's property. Thus the architect, immediately upon starting his work, obtains exact dimensions for his plans, so that the builder has these fixed dimensions to work to and from which to order materials in advance.

Materials.

With regard to materials, a small brick is used, measuring on the average about 8½ ins. by 4½ ins. by 2½ ins., except glazed bricks, for which the English size is generally used. The bricks are laid in all manner of bonds, such as English, Flemish, no-bond, &c. For this last reason English brickwork is superior structurally to American. Timber is much more extensively used, and is much cheaper than here. This is the reason of so many wooden houses being erected, and also so much "mill construction," or what is called "slow-burning construction." Terra-cotta, the author considered, has reached a higher usefulness in America than here, the reasons being, first, the greater variety of clays, which gives the opportunity of furnishing almost any colour or shade; and, secondly, it is particularly fitted for an external covering to a steel skeleton frame. America is also in advance in its manufacture, the terra-cotta being straighter, truer, and produced in much larger blocks than here, thus more nearly approaching stone in design.

There is very little concrete stair work in the States, cast-iron being used in fire-resisting buildings on account of the lightness of

construction. In the author's opinion it would be better for American practice, especially as regards fire-resistance, to follow the English by using concrete staircases in all fire-resisting buildings, and also as regards the system of concrete lintels in use here but not in America.

For buildings over eight storeys in height the prevailing system of floor construction is either hollow terra-cotta blocks built in arch form, with either flat or segmental soffits or some form of reinforced concrete. Partitions in these buildings are of hollow terra-cotta blocks, expanded metal or "Mack." Breeze building blocks are not yet used. In New York all buildings over twelve storeys in height must not only have the floors and partitions of fire-resisting material, but if woodwork be used it must be treated, whatever its kind, by a fire-resisting process. All exterior window frames and sashes must be of metal with fire-resisting glazing.

Party-walls are not customary in the larger buildings, and the cantilever foundation has been devised to meet the need of supporting adjoining walls on their respective curtilages without the expense of underpinning and guarding against disturbance that comes from using spreading foundations which enter upon neighbouring land.

The author called particular attention to the large amount of cast-iron work used in the States in the framework of buildings up to twelve storeys in height. Cast-iron, he believed, could be used to great advantage here for stanchions.

The Skyscraper.

Passing on to consider the "skyscraper," a type of building that has more or less revolutionized building practice, the author referred to the tales occasionally heard of forty-storey buildings. Such, he believed, could be safely built; but he thought that the practical commercial building would not be higher than twenty storeys, and that would soon be the limit. When built on proper lines the life of these steel-frame buildings is as long as that of other buildings. The steel is entirely buried in concrete, all exterior stanchions being enclosed in brickwork, and the interstices grouted full of cement-mortar. The interior stanchions are similarly covered by bricks or fireclay. As to a comparison in cost between buildings supported on steel stanchions and by ordinary brick walls or piers, the cost of carrying a load on a steel stanchion is about one-third that for carrying the same load on a brick pier, provided the load is about 60 tons. There is also a saving of floor space by steel construction. The advantages too in the way of planning are great, for walls can be taken out and large areas gained wherever desired. Again, the building's advancement does not entirely depend upon weather or even daylight, as work can be carried forward in the various shops and well in advance. Not only that, but the steel frame can be pushed ahead and the enclosing shell can follow at any floor.

In conclusion the author said that architect and builder should work together. The builder must have plans, details and instructions complete and definite at the earliest moment in order to accomplish the desired results. Give him full control and make him alone responsible. If the architect deals with one person for a portion of the work and another for something else, he not only relieves the builder of a portion of that responsibility, but he actually hampers the builder's progress, for then the other person looks to the architect and not to the builder.

Mr. Benjamin I. Greenwood (president of the Institute of Builders) proposed and Mr. John Slater seconded the vote of thanks. Messrs. Howard Colls, William Woodward, E. W. Hudson and A. T. Taylor (Canada) also took part in the discussion.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Moment of Inertia.

BRADFORD.—F. writes: "Please explain how to use the least moment of inertia (1) for a 12in. by 6in. by 54 lbs. r.s. joist over a span of 12ft. with a load of 4 tons 3ft. from one end, and (2) for a similar beam used as a stanchion, height 16ft., ends fixed."

A rolled joist may have the moment of inertia taken in two directions. When it is resting on one flange, as in its ordinary position as a girder, the greatest moment of inertia comes into play, that is, the tendency to bend takes place in the direction of the greatest resistance, which is the depth. When the rolled joist is used as a stanchion the least moment of inertia comes into use, as the tendency to bend will be in the direction of the least width. For example a 12in. by 6in. by 54 lbs. rolled steel joist on a span of 12ft., with a load of 4 tons concentrated at 3ft. from one edge of the span will have a maximum bending moment $M = \frac{Wxy}{L} = \frac{4 \times 3 \times 9}{12}$

$= 9$ ton-feet or 108 ton inches. The moment of resistance $R = \frac{I}{c}$, $I =$ greatest moment of inertia $= 369.91$, $y =$ distance from neutral axis to furthest edge of section $= \frac{1}{2}$ depth, $= 6$ ins., $c =$ strength modulus, say 8 tons per sq. in. Then $R = \frac{369.91}{6} \times 8 = 493.21$ ton-inches, which the joist is capable of standing, while the actual bending moment put upon it is only 108 ton-inches. The same joist used as a stanchion 16ft. high would carry a safe load of about 60 tons, worked as follows: By Rankine's modification of Gordon's formula

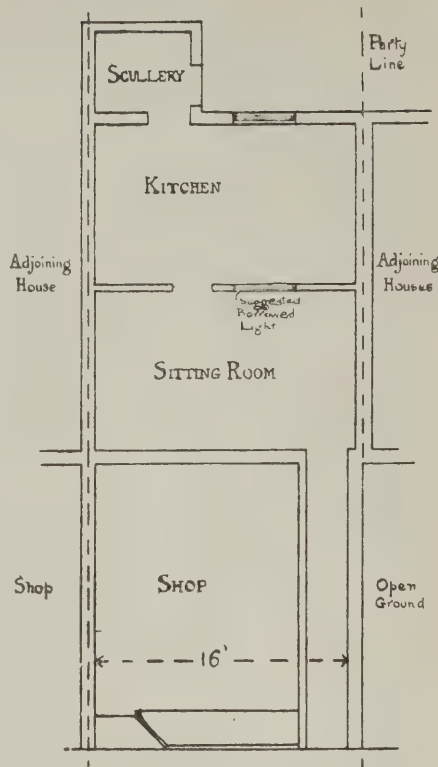
$p = \frac{f}{1 + \frac{f^2}{c^2}}$, where $p =$ safe load in tons per sq. in., $f =$ maximum working stress in tons per sq. in. on a short specimen (say 6 for mild steel), $l =$ length of stanchion in inches, $c =$ constant $= 36,000$ for flat ends, $r^2 =$ radius of gyration in inches squared $=$ moment of inertia. The area of section being 15.9 sq. ins. and the least moment of inertia 31.43, the radius of gyration squared $= \frac{I}{A} = \frac{31.43}{15.9} = 1.976$. Then $p = \frac{6}{1 + \frac{(6 \times 12)^2}{36000 \times 1.976}} = \frac{6}{1 + .518} =$ say 4 tons per sq. in. The sectional area being 15.9 sq. ins., the safe load will be $15.9 \times 4 = 63.6$ tons.

HENRY ADAMS.

Paving Apportionments.

WIGAN.—PAVEMENT writes: "An estate, A, at the corner of a street and a highway, faces another estate, B, on the opposite side of the street. Can the owner of estate A be compelled to pay the cost of paving apportionment of street laid down by estate B? The street was laid out by B. for his own convenience and benefit up to and adjoining A, but is not used by A."

We should say not; but can find no record of any legal decision on this point. Certainly the owner of estate B cannot make the owner of estate A pay anything. It is only the properly constituted local authority who can compel payment for making up a road.



Books on Architectural Design and Construction.

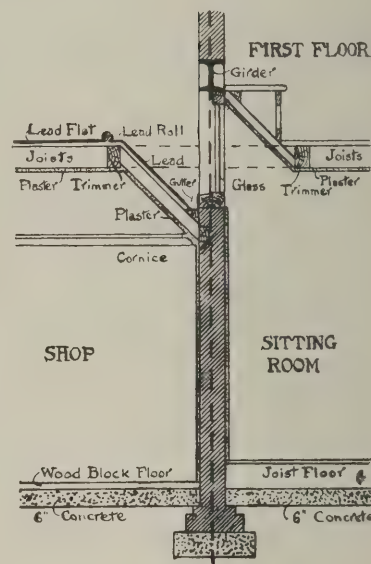
(1) CHATHAM.—NAVAL writes: "Please recommend one or two books on the principles of architectural design, giving prices."

(2) X. Y. Z. writes: "Do you know of any books that deal solely with ancient Roman construction and architecture; also a good work on Etruscan architecture, giving plenty of detail. I should be glad if you would give an illustration showing the method of roofing the ephebeum or large hall in the ancient baths (I presume that the brick vaulting was not exposed externally); also the method of lighting. I am aware that M. Choisy has written the most extensive work on Roman construction, but do not know where his works may be seen in England nor what is the price of them, and being but an indifferent French scholar would much prefer a book written in English."

(1) There is no one book that deals thoroughly with the subject of architectural design. In fact, the subject embraces the whole of building construction, art history and social and intellectual life. We can only recommend you to read Ruskin's "Seven Lamps of Architecture" and the chapter on "The Nature of Gothic" in "The Stones of Venice"; Viollet-le-Duc's "Rational Building"; Eidlitz's "Nature and Function of Art, more especially of Architecture"; Fletcher's "History of Architecture"; Prior's "History of Gothic Art in England"; Blomfield's "Renaissance Architecture in England"; and H. H. Statham's "Architecture for General Readers" and "Modern Architecture," taking them in the order stated.

(2) Early Roman architecture has been very inadequately treated by English writers. We only know of Choisy's work as at all a proper treatment. You can probably obtain a copy from Mr. B. T. Batsford, of 94, High Holborn, W.C. The Roman method of roofing by concrete domes in the Roman baths is explained by Choisy, with fine plates of suggested restorations. Copies can be seen in the library of the Royal Institute of British Architects, 9, Conduit Street, W., and at the British Museum. Some of Choisy's conclusions are summarized by Viollet-le-Duc in his "Rational Building," of which there is an English translation (post free 12s. 6d. from our offices).

A SHOP ALTERATION.



A Shop Alteration.

BARROW-IN-FURNESS.—H. J. A. writes: "The accompanying plan shows a proposed shop addition to some houses. Which is the best way to light the sitting-room? You will notice that this room is practically in darkness except for the borrowed light, which could be put in the wall dividing it from the kitchen. The positions of the two rooms may be altered in any way, but the property adjoining must not be touched."

Your proposal to gain light to the sitting-room with a borrowed light would, in our opinion, be most objectionable, and the ventilation would become difficult. We suggest two methods of improving the lighting of the sitting-room. In the first place, we suppose the shop will be a single-floor one, and therefore it would be possible to obtain a top light in the sitting-room in a similar way to that usually adopted with basements, as shown in the section above. A portion of the shop could be cut back so as to give a greater amount of window surface. If the window extended across the whole width of the sitting-room a good light should thus be possible, for the maximum light is obtained within the angle of 45 degs. to which the floor and the ceiling are raked back; but if the window cannot be made of good length, by the use of prismatic glass the lighting could no doubt be rendered fairly good. By use of a wood-block floor in the shop greater height could be gained. We assume the floor of the sitting-room to be of the ordinary kind—boards and joists with concrete under. You do not show the position of the staircase on the plan. If the shop is to be built over, then we suggest the second method, namely, to relegate the kitchen to a back addition with the scullery. The extra cost of this would not be very great; and although it might be thought that the sitting-room would thus be enlarged beyond what was necessary, the extra space would no doubt be much appreciated, while the lighting could by such means be adequate.

Architects and their Assistants.

KEIGHLEY.—X. writes: "Last July I was suffering from a nervous breakdown, partially caused by overstrain of the eyes, and left the office where I was employed without first consulting either of the principals. I

wrote explaining the cause of my absence, and enclosed a doctor's certificate. In reply I received a curt letter saying my services were no longer required. I again wrote on July 17th and September 27th, but the letters have not been acknowledged. Please advise me what to do in the circumstances. Would it be advisable to bring an action against the firm (1) to obtain a testimonial, (2) for breach of agreement in not giving me a month's notice? If so, could you give me some idea of the expense? In previous cases of illness I have always received the most considerate treatment, but this last appointment was with a firm who regarded architecture simply as a business for making money. Both partners in the firm are Fellows of the Institute, and the senior partner is, I believe, a J.P. I send copies of correspondence and agreement."

After carefully reading your agreement and correspondence, I am of opinion that you have absolutely no case against your late employers for not giving you a testimonial or reference. No employer is required to give one unless he has agreed to do so, which is almost an unheard-of agreement. But in regard to the month's notice you have something of a case, though a very doubtful one. Speaking generally, an employer (in such a case as this, and in the absence of agreement or custom to the contrary) is liable to pay the wages of his employee while the latter is ill. It was decided in the case of *Cuckson v. Stones* that the "incapacity of the servant from sickness is not a determination of the contract, nor will it justify dismissal without regular notice." At the same time, it might be successfully argued for the employers (I do not know all the facts) that the plaintiff had waived any claim he had by his subsequent conduct and correspondence, or by his method of leaving them. He would claim damages equal to a month's wages, namely, £11. The cost of a county-court action of this kind would vary from £2 to £10 or more, according to whether the plaintiff conducted the case personally or employed a solicitor and counsel. S. P. J. M.

Old Chelsea Church and Greenwich Hospital.

LAVENDER HILL.—AKANTHOS writes: "Would complete measured drawings of Chelsea Old Parish Church form, in every way, a suitable testimony for the R.I.B.A. final; or would a portion of Greenwich Hospital be better? If the latter, would the façade only be required, or would the rooms, &c., have to be shown completely, and which portion would you recommend? Is not some of it Inigo Jones's design?"

The following opinion of the Old Church, Chelsea, expressed by Walford in his "Old and New London," is that shared by all who feel themselves in a position to criticize architecture: "The old parish church of Chelsea, dedicated to St. Luke, stands parallel with the river. It is constructed chiefly of brick, and is by no means conspicuous for beauty. It appears to have been erected piecemeal at different periods, and the builders do not seem to have aimed at the slightest degree of architectural arrangement; nevertheless, though the building is sadly incongruous and much barbarized, its interior is still picturesque." If, therefore, you wish to choose between Old Chelsea Church and part of Greenwich Hospital, the latter place is superior in every respect. The R.I.B.A. examiners would probably accept a good drawing of the façade, but a plan, section and elevations are usually sent in for the measured drawing testimony of study. If you propose to draw a plan as well as an elevation, any one or part of one of the five blocks would be satisfactory for the purpose. One side of a courtyard of any of the four main blocks could probably be measured

and drawn within a reasonable time, but your best plan would be to go to Greenwich and select the whole or part of one of the blocks according to the time at your disposal. The block known as the Queen's House, which was built in 1615-32 for Henrietta Maria, was from Inigo Jones's design, as also was the right-hand block looking from the river on to the river-front. This latter block was built as a palace for Charles I., and is usually known as the King's House. The greater part of Greenwich Hospital is by Sir Christopher Wren, but parts also are by Ripley, Hawksmoor and Vanbrugh.

H. Y. M.

Shrinkage of Measuring Tape.

WORCESTER.—VERGE writes: "Is it a fact that an ordinary metallic wire-woven measuring tape (66ft. roller) sensibly expands and contracts under different temperatures? A friend of mine asserts that his tape is 3ins. shorter in winter than in summer (in the 66ft. length), and I question his statement."

The wire-woven tapes are only useful for approximate measurements; for accurate work a steel ribbon tape must be used. A 66ft. Chesterman's wired tape was used by the writer on wet grass and wound up again. Two days after it was tested at the Guildhall, London, and found to measure 65ft. 4ins.; three weeks later it was again tested and found to be 65ft. 9ins. The normal length when dry was 66ft. HENRY ADAMS.

Stables and Coach-houses.

PLYMOUTH.—REGULAR READER writes: "(1) In designing a stable for three horses will the loose-box serve regularly for a stall, or should a stall be provided for each horse, and the loose-box in addition? (2) What is meant by 'guard stones,' 'wheel lines' and 'stop stones' to a coach-house?"

In reply to the foregoing Mr. Percival Chubb, secretary of the St. Pancras Iron Work Co., Ltd., has been kind enough to send the following: "(1) In designing a stable for three horses we should recommend, say, two stalls and one loose-box, and if possible one box with no communication with the rest of the stable, for sick horses. (2) Guard or other spur stones are made to protect the entrance wall or sides from damage by carriage or cart wheels. With regard to wheel lines and stop stones, these may refer to wheel tracks laid in the paving for the carriage wheels, and projecting stones to prevent the carriage being run back in such a manner as to damage the panels against the back wall of the coach-house; or they may refer to the lines on which the coach-house door runs when opening, in which case the stop stones would mean the iron sockets."

Hospital Design.

X. Y. Z. writes: "What is the most modern system of flooring for the wards and corridors and the lavatories and conveniences of a cottage hospital? We presume tiling and mosaics are much too cold. Would a treatment of tile-work and adamant be a suitable finish to the walls, &c.? What system is the best to adopt to ensure perfect ventilation? If central fires were adopted, which would be the best make and system? We presume it would not be wise to have descending flues where there were both first- and second-floor levels. Is it possible for a central shaft or chimney to be carried through the ridge?"

For the wards teak is often used, but "Eubœolith" is also much favoured. The latter is very suitable for lavatories and conveniences. Tiling and mosaic are too cold for the wards, but are often used for the lavatories. The finish for the walls which you suggest is very suitable; the plaster is often varnished or enamel painted. No doubt the most perfect system of ventilation for a hospital is the plenum system, but the

expense does not always permit its use, and recourse is had to radiators under the windows and extract flues in the walls. Shorland's central stoves are very good ones. Descending flues are often adopted for floors above the ground, and we see no objection to this. A central shaft could be used for carrying off the smoke and products of combustion, as well as the foul air, but the additional expense usually prevents such a proceeding.

A Fire-resisting Strong-room.

LEAMINGTON SPA.—FIREPROOF writes: "I have to fit up a strong-room with shelves and pigeon-holes for a firm of solicitors. The fittings must of course be fire-resisting, and must be free from anything likely to injure parchment deeds or destroy the ink. Would pine rendered fireproof be suitable, or can you recommend anything better?"

It is apparent that if the interior of a strong-room became hot enough to scorch the wood of the shelves the papers would be burnt, and therefore there is no necessity to use a fire-resistant wood. There is an especial objection to using wood which has been processed because the chemicals are hygroscopic and continually keep the wood damp, which would be most deleterious to parchment, paper and ink. You can use ordinary wood for the shelves or adopt tinned sheet-iron or wire-work shelves similar to those in libraries, which are often preferred.

Attendance Item in Quantities.

SUBSCRIBER writes: "In bills of quantities I have often noticed an item similar to the following:—

Item 1.—Heating and Ventilation.

Allow for attending upon, cutting away for, and making good after hot-water engineer in all trades. £ s. d.

When the work has to be done trouble always arises, as the builder happens either by chance to have left out the item, or has merely allowed, say, £10, which he may consider as a mere 'sporting item' providing for unforeseen circumstances. I am at present connected with a firm who have ignored the item altogether, as the items following were based on what the quantity surveyor could foresee, these being priced. Now the engineers ask for pipe clips to be built in the wall to carry the pipe. The contractors, however, contend that they need only fix the pipe. Of course, if the contractors had allowed for the pipe clips in their estimating no question would have been raised. I should like to have your opinion on the matter."

The item to which you refer covers fixing the pipe clips and also cutting holes in walls, floors, &c., and all making good. It is certainly of a "sporting" nature, although a very fair idea of the work involved can be obtained by an examination of the drawings especially if the contractor has an opportunity of seeing the engineer's plans. A fairer method (although the contractor generally has no control in the preparation of the quantities) is to get from the heating engineer the number of holes he requires and any other particulars of the necessary work outside his own contract. Another method sometimes followed is to put in a provisional sum for attendance, leaving the matter to be adjusted at the settlement of accounts, but as this usually involves daywork it is again unsatisfactory owing to the difficulty of separating this from the items chargeable at contract rates. W. E. D.

Belfast's new Technical Institute is making good progress, and is expected to be finished by June next. The institute faces College Square East and measures 240ft. by 204ft., with an area of 100,000 sq. ft. for classrooms. Mr. Samuel Stevenson is the architect and Messrs. W. J. Campbell & Sons are the builders.

Tenders.

Anerley.—For the erection of a bakery and tailor's shop at the Anerley Residential Home for elder deaf boys, and the provision of the necessary trade fittings in connection therewith, for the London County Council:—

F. & H. F. Higgs, Hinton Road, Herne Hill	£1,863	0	0
J. Marsland & Sons, 1, York Street, Walworth	1,796	0	0
Rice & Son, 15, Stockwell Road	1,787	0	0
W. Downs, Hampton Street, Walworth Road	1,785	0	0
L. Whitehead & Co., Ltd., Portland Works, Clapham Road	1,727	0	0
E. Triggs, 92, The Chase, Clapham	1,698	0	0
W. Akers & Co., Ltd., 13, High Street, South Norwood	1,680	0	0
J. Smith & Sons, Ltd., Junction Works, South Norwood	1,668	0	0
T. G. Sharpton, Machell Road Works, Nunhead	1,663	0	0
J. Garrett & Son, 17, Balham Hill	1,655	0	0
J. & C. Bowyer, Westow Street, Upper Norwood	1,579	0	0
W. Johnson & Co., Ltd.,* Wandsworth Common	1,555	0	0

* Recommended for acceptance.

Bradford.—For extension and additions to subway at the Union Hospital, Horton Lane, Bradford, for the Guardians:—

E. Smethurst	£1,900	0	0
Eastwood & Bentley	1,841	10	0
J. Moulson & Son	1,795	0	0
F. Fielding	1,768	8	0
Normington & Proctor	1,740	0	0
W. H. Holroyd	1,599	10	0
J. Brown & Son, Bingley, near Bradford	1,590	0	0
J. Totty	1,580	0	0
C. Booth & Son	1,500	0	0
Balmforth & Ingham	1,450	0	0
W. R. Booth	1,405	0	0
Toothill & Balmforth	1,392	0	0
O. Booth & Son*	1,372	10	0

* Accepted. [Rest of Bradford.]

Bratton Fleming.—For the erection of a Council school for 136 children, and master's house, for the Devon County Education Authority. Mr. P. Morris, architect. Quantities by Mr. J. W. Haughton, Plymouth:—

E. Ellis & Son	£2,704	0	0
R. Pickett	2,667	13	3
H. Burgess	2,620	0	0
E. Karslake	2,596	10	0
W. Slee	2,423	9	0
A. C. Jones	2,367	16	6
R. Goss & Son	2,359	2	5
J. Bryant & Son	2,295	0	0
W. T. Stevenson	2,195	0	0
F. J. Badcock	2,193	0	6
F. J. Stanbury	2,190	9	2
H. Sillifant & Son	1,889	5	0
Woodman & Son,* Exeter	1,841	6	6

* Accepted.

Canwell Hall.—For the conversion of existing gas-house and addition to engine-house, &c., as an electric-light station on the Hall estate, Staffs, for Mr. Philip S. Foster, M.P. Mr. C. M. C. Armstrong, architect, 5, High Street, Warwick:—

Maple & Co.	£1,398	0	0
W. J. Whittall & Son,* Birmingham	1,242	2	6

* Accepted provisionally.

Cardiff.—For carrying out alterations and extensions to premises, 9, Queen Street. Mr. Edwin Seward, F.R.I.B.A., architect, Queen's Chambers, Queen Street, Cardiff:—

S. Shepton & Son	£4,672	5	0
F. Ashley, Canton	4,645	2	5
W. Williams	4,199	0	0
G. Griffiths	3,837	0	0
G. Hallett	3,820	0	0
D. Davies	3,796	0	0
W. Symonds, Canton	3,718	7	3
F. Small	3,620	0	0
E. Turner & Son	3,588	0	0
Knox & Wells	3,567	0	0
C. C. Dunn	3,399	16	0
W. Thomas & Co.,* Tresilian Terrace, Penarth Road	3,365	0	0

* Accepted. [Rest of Cardiff.]

Claybury.—For the supply and fixing of a hot-water circulating installation, with fittings, at Claybury Asylum, for the London County Council:—

Strode & Co., 48, Osnaburgh Street, N.W.	£3,887	0	0
G. N. Haden & Sons, Trowbridge	3,859	0	0
Newton, Chambers & Co.,* Sheffield	3,360	0	0
Ashwell & Nesbit,† Bedford Row	3,312	0	0
Lea & Warren, Kettering	3,131	0	0
Dargue, Griffiths & Co., Ltd., Liverpool	2,970	0	0
W. Symonds, Canton	2,699	15	0

* Accepted. † Alternative schemes.

London, S.E.—For the construction of an underground convenience in Waterloo Road, near its junction with York Road and Stamford Street, for the Lambeth Borough Council. Mr. Henry Edwards, C.E., borough engineer:—

Builders' work.			
F. W. Harris & Co., Barnsbury, N.	£2,970	0	0
H. C. Payne, London, S.W.	2,888	0	0
Davis & Bennett, London, S.W.	2,855	0	0
Safety Tread Syndicate, London, E.C.	2,721	0	0
W. J. Renshaw, Putney, S.W.	2,618	0	0
H. Kent, Lewisham, S.E.	2,577	0	0
Doulton & Co., Lambeth, S.E.	2,574	0	0
B. E. Nightingale, Albert Embankment, S.E.	2,473	0	0
W. Moss & Sons, Upper Clapton, N.E.	2,469	10	4
Spencer, Santo & Co., London, W.	2,400	0	0

Martin, Wells & Co., Vauxhall, S.E.	£2,399	0	0
Chambers Brothers, Ealing, W.	2,395	0	0
G. Jennings, Ltd.,* Lambeth, S.E.	2,386	10	6
J. Shelbourne & Co., London, E.C.	2,360	0	0
T. Almond & Son, Ponder's End, N.	2,332	0	0
W. H. Hyde, Norwood Junction, S.E.	2,322	0	0

Sanitary engineering and plumbing.

Adamsez, Ltd., Westminster	315	4	0
G. & D. Musgrave, London, W.C.	271	0	0
Davis & Bennett	269	0	0
G. Jennings, Ltd.	258	6	0
W. J. Renshaw†	245	0	0
B. Finch & Co., Lambeth	242	10	0
Doulton & Co.	242	0	0
W. Moss & Sons	131	8	2

Founders' work.

Doulton & Co.	180	0	0
G. Jennings, Ltd.	148	0	0
Davis & Bennett	135	0	0
W. Moss & Sons	104	1	6

Entire work.

Davis & Bennett†	3,259	0	0
Doulton & Co.	2,996	0	0
G. Jennings, Ltd.	2,792	16	6
W. Moss & Sons	2,705	0	0

* Accepted for entire work. † If galvanized gratings are required over base channels, add £13; if Finch's No. 2-6 urinals are used, add £35. ‡ Price includes wrought-iron railings.

Mountain Ash.—For the erection of twenty-five houses for the Cilhau Building Club. Mr. T. W. Millar, architect and surveyor, Mountain Ash:—

T. W. Davies	£5,475		
Jenkins Brothers	5,250		
Jones Brothers	5,200		
Davis & Co.,* Mountain Ash	5,100		

* Accepted.

Selby.—Accepted for the construction of an engine and boiler house, foundations for engine and pumping machinery, chimney shaft, coal store, workshop, &c., in connection with the new waterworks, for the Urban District Council:—

H. Arnold & Son, Doncaster	£2,925		
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Spilsby.—For the erection of a new post-office. Mr. J. E. Butcher, architect, Spilsby:—

J. H. Hunter, Spilsby	£1,316	12	0
F. Rattenbury, Spilsby	1,130	0	0
J. T. Turner & Sons, Wainfleet	1,050	0	0
A. Wood, Alford	996	7	6
J. Kine, Caudesby	943	0	0
C. T. Lettice, Bolingbroke	913	0	0
J. G. Holmes & Sons, Skegness	900	0	0
W. Walker, Spilsby	879	0	0

* Accepted.

Wimbledon.—For the erection of a house in Alan Road, for Mr. Charles J. Dixey. Mr. G. A. Lansdown, architect, 9, Regent Street, Waterloo Place, S.W.:—

Dove Brothers	£2,315		
Parsons & Townsend	2,270		
H. & E. Lea	2,100		
J. Marsland & Sons	1,986		
Johnson & Co.	1,850		
W. Hammond	1,830		
C. Ansell	1,818		
Whitehead Brothers	1,780		
J. Burgess & Sons*	1,727		

* Reduced and accepted.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending November 17th twenty-four failures in the building and timber trades in England and Wales were gazetted.

W. B. Ashby, builder, Derby.	Deficiency £1,688.
H. T. Cook, builder, Southend-on-Sea.	Adj. Nov. 7th.
J. SUGDEN, plumber, Liverpool.	Adj. Nov. 10th.

H. W. TARRANT, builder, Frimley. Adj. Nov. 11th.
W. ELLIS, junr., surveyor, Clapham Junction. P.E., Wandsworth C.C., Nov. 30th, at 12.
H. BAILEY, builder and contractor, Hull. R.O. Nov. 11th.

E. CORNER, builder and contractor, Bridlington. P.E., Scarborough C.C., Dec. 12th, at 12.
JOHNSON & ROBINSON, builders and contractors, Hull. R.O. Nov. 5th.

G. NETTLETON, joiner, Leeds. P.E., Leeds C.C., Nov. 28th, at 11.

H. WOOLF, builder and contractor, London, E. Adj. Nov. 7th.

W. SAMPSON, builder, Watford. P.E., St. Albans C.C., Nov. 28th, at 10.30.

F. T. PENNY, builder, Northfield. Liabilities £991; assets £160.

A. E. M. SMITH, builder, London, E.C. Liabilities £450; assets £20.

T. NIXON, builder, London, N. Liabilities £3,845; estimated surplus £471.

J. N. DAWSON, builder, Yarmouth. Liabilities £305; deficiency £283.

C. FIELDING, builder and contractor, Glossop. P.E., Ashton-under-Lyne, Town Hall, Dec. 14th, at 12.

J. BATES, builder, Hedge End. First meeting, O.R.'s, Southampton, Nov. 22nd, at 2.30. P.E., Southampton C.C., Nov. 29th, at 12.

J. ORMROD, builder, Great Lever, late Bolton. First meeting, 19, Exchange Street, Bolton, Nov. 22nd, at 3. P.E., Bolton C.C., Dec. 13th, at 3.

G. S. LIST, builder, London, S.W. First meeting, Bankruptcy Court, Nov. 22nd, at 12. P.E., same, Dec. 15th, at 12.

DYER & ARTHUR, plumbers, Newport. First meeting, O.R.'s, Newport, Nov. 22nd, at 11. P.E., Newport Town Hall, Dec. 7th, at 11.

R. F. LAWRENCE, architect and surveyor, Newport. First meeting, O.R.'s, Newport, Nov. 22nd, at 12. P.E., Newport Town Hall, Dec. 7th, at 11.

A. J. RUTSON, builder and contractor, Brighton. First meeting, O.R.'s, Brighton, Nov. 22nd, at 12. P.E., Brighton C.C., Nov. 23rd, at 11.

E. CHATWIN, builder, Birmingham. First meeting, 191, Corporation Street, Birmingham, Nov. 24th, at 12. P.E., Birmingham C.C., Dec. 18th, at 2.

E. STRINGER, painter and decorator, Bradford. First meeting, O.R.'s, Bradford, Nov. 23rd, at 3. P.E., Bradford C.C., Dec. 6th, at 10.

Coming Events.

Wednesday, November 22.

NORTHERN ARCHITECTURAL ASSOCIATION.—Opening Meeting of Session at 7.30 p.m.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. J. A. Morris on "A Scottish Town," at 8 p.m.

Thursday, November 23.

BUILDERS' BENEVOLENT INSTITUTION.—Fifty-eighth Annual Dinner, Hotel Metropole, at 7 p.m.

Monday, November 27.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

Tuesday, November 28.

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. R. W. Orme on "Italian Renaissance," at 6.30 p.m.
ARCHITECTURAL ASSOCIATION OF IRELAND.—Mr. P. J. O'Reilly on "The Evolution of the Irish Wheel Crosses," at 8 p.m.

Wednesday, November 29.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. T. Haddon on "A Practical Demonstration of Wrought-iron Work," at 8 p.m.

"CLOISSONNE GLASS" WEATHER RESISTING.

Production 1904—17,000 square feet.

The
CLOISSONNE GLASS
CO.

9^E Berners St., Oxford St.,
London, W.

Prices from 3/- per square foot.

Fire-Resisting Hardwood Doors,

Specially suitable for
HOSPITALS, HOTELS, FLATS, THEATRES, PUBLIC INSTITUTIONS.

REMARKABLE RESULT

of a
FIRE TEST.

A door as shown in the accompanying illustration, built by the Gilmour Door Co., Ltd., was subjected to the Official Fire Test of the British Fire Prevention Committee.

The heat maintained was from 1,600 to 1,700 degrees, and the door withstood the fierce attack of the fire for ONE HOUR.

The door passed the above official test in a most satisfactory manner.



The Gilmour Fire-resisting Doors are not heavy, clumsy, ugly, or expensive. No one could tell them from the ordinary Oak, Mahogany, and other Hardwood Doors.

The use of them means protection to property, and increased safety from Fire.

Architects are invited to inspect the Specimen Doors on exhibition at the Company's or their various Agents' Showrooms, to satisfy themselves as to the construction, quality, and artistic merit.

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Also various Agencies throughout the Provinces.

FACTORIES: TRENTON, CANADA.

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The Ideal Floor for
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OVER
600,000
YARDS
ALREADY LAID.

HIGHEST
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Can be successfully laid on Concrete, old Wood Floors, Flagstones, &c.

As used by H.M. OFFICE OF WORKS
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THE WAR OFFICE and
THE LEADING ARCHITECTS.

Write to-day for Samples and Particulars to—

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3 Victoria Street, WESTMINSTER, S.W.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
Nov. 23	Ashford—Screen	Managers	F. G. Beeching, Clerk, Ashford, Middlesex.
" 23	Queen's Ferry—School	Education Committee	S. Evans, Architect, County Offices, Mold, Flint.
" 23	Mirfield—Warehouse ... ..	...	J. Kirk & Sons, Architects, Huddersfield.
" 23	Sheffield—New Roofing, &c.	Tramways Committee	C. F. Wike, City Surveyor, Town Hall, Sheffield.
" 23	London, N.E.—Convenience	Hackney Council	Norman Scorgie, Borough Engineer, Town Hall, Hackney, N.E.
" 23	Southville—Alterations to School	Education Committee	P. Addie, Council House, Bristol.
" 23	Shotton—Temporary School	Education Committee	County Surveyor's Office, Mold, Flintshire.
" 24	Belvedere—School	Education Committee	W. Egerton, Architect, 12 Queen's Road, Erith.
" 24	Holyhead—Business Premises	Co-operative Society, Ltd.	H. Thomas, Architect, Castle Buildings, Carnarvon.
" 24	East Preston—Infirmary, &c.	Guardians	Guardians' Office, East Preston.
" 24	Erith—Alterations to Schools	Education Committee	W. Egerton, Architect, 12 Queen's Road, Erith.
" 24	Wrexham—Alterations, &c.	Worthington & Co.	F. A. Bevan, Architect, Queen Street, Wrexham.
" 24	Norwich—School Library, &c.	Education Committee	C. J. Brown, Architect, Cathedral Offices, The Close, Norwich.
" 25	Halifax—Houses	Shaw & Helliwell	H. Thompson, Architect, Post Office Chambers, Elland.
" 25	Swindon—Bakery, &c.	Industrial Co-operative Society Ltd.	R. J. Beswick, Architect, 10 Victoria Road, Swindon.
" 25	Ickford—School	Education Committee	Clerk of Works, Education Office, Aylesbury.
" 25	Manchester—Additional Building	Education Committee	School of Technology, Sackville Street, Manchester.
" 27	Rochester—Technical Institute	Council	A. Kennett, Town Clerk, Rochester.
" 27	Altofts—House	Urban District Council	District Council Offices, Altofts.
" 27	Newport—Strengthening Roof	Corporation	Borough Engineer's Office, Town Hall, Newport.
" 27	St. Athan—House	D. Hopkins	D. Hopkins, Llancadle, Cowbridge.
" 27	Salford—Offices, &c.	Tramways Committee	General Manager, Tramways Department, Salford.
" 27	Bromley—Municipal Buildings	Town Council	R. F. Atkinson, Architect, 8 Sackville Street, W.
" 28	Reading—Enlargement of Sorting-office	H.M. Office of Works	H.M. Office of Works, Storey's Gate, London, S.W.
" 28	Kensington—Working Men's Flats	Borough Council	W. Chambers Leste, Town Clerk, Town Hall, Kensington.
" 28	London, E.—Car Shed	County Council	Highways Section, Architect's Department, 11 Charing Cross, S.W.
" 28	Holyhead—Business Premises	Market Cafe Co., Ltd.	J. Owen, Architect, Exchange Chambers, Holyhead.
" 28	Belfast—Library	Technical Instruction Committee	Graeme-Watt & Tulloch, Architects, 77A Victoria Street, Belfast.
" 28	Poulton—Schools	Urban District Council	T. Samuel, Central Park, Liscard, Cheshire.
" 28	West Bolden—Builders' Work	County Council	W. Rushworth, Architect, Education Offices, Durham.
" 29	South Shields—Baths and Washhouses	Town Council	J. H. Morton, Architect, 50 King Street, South Shields.
" 30	Styal—Homes	Guardians	J. W. Beaumont & Son, Architect, 10 St. James's Square, Manchester.
" 30	Uffington—Alterations to School	Managers	G. Cosser, Post Office, Uffington.
" 30	Bournemouth—Schools	Education Committee	Borough Engineer, Bournemouth.
" 30	St. Austell—Alterations to Chapel	County Council	J. Mutton, Architect, Charlestown, St. Austell.
" 30	Henfaes Bridge—Wall	Education Committee	C. H. Mounsey, County Surveyor, Carmarthen.
Dec. 1	Heacham—Schools, &c.	Education Committee	H. J. Green, Architect, Castle Meadow, Norwich.
" 1	St. Albans—School	Education Committee	U. D. Smith, County Surveyor's Office, Hatfield.
" 1	Thetford—Enlargement of School	Education Committee	A. F. Scott, Architect, Castle Meadow, Norwich.
" 1	Burgh-next-Aylsham—School	Education Committee	A. F. Scott, Architect, Castle Meadow, Norwich.
" 1	Limavady—Hall	Committee of Management	D. Conroy, Architect, 21 Shipquay Street, Londonderry.
" 2	Renishaw—Alterations to School	Education Committee	F. H. Fisher, Architect, The Mount, Killamarsh, Sheffield.
" 2	Darlaston—School	Education Committee	Education Offices, Stafford.
" 5	London, S.W.—Re-tiling Bath	Council	Works Department, Westminster City Hall.
" 5	Guston, Dover—Duke of York's Military School	H.M. Office of Works	H.M. Office of Works, Storey's Gate, London, S.W.
" 6	Hull—Superstructure of New Post-office	H.M. Office of Works	H.M. Office of Works, Storey's Gate, London, S.W.
" 6	Braintree—Partitions, &c.	Education Committee	F. Whitmore, Architect, Duke Street, Chelmsford.
" 6	Llandoverly—Alterations, &c.	Town Council	A. S. Williams, Architect, Llandilo.
" 8	Pinged—Conveniences, Boundary Walls, &c.	Education Committee	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Llechfedyach—Repairs to School	Education Committee	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Llanwrda—School Alterations, &c.	Education Committee	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Alltwales—Repairs and Ventilation	Education Committee	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Pontycaes—Repairs to School	Education Committee	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 9	Heston—Alterations to Schools	Education Committee	A. Lancelot Lang, Architect, Council House, Hounslow.
" 11	Barning Heath—Connecting Covered-way, &c.	County Asylums Committee	W. J. Jennings, Architect, 4 St. Margaret's Street, Canterbury.
" 11	Acton—Magistrates' Court	County Council	H. T. Wakelam, County Architect, Middlesex Guildhall, Westminster.
" 11	Brentford—Additions at Town Hall	County Council	H. T. Wakelam, County Architect, Middlesex Guildhall, Westminster.
" 19	Kirton—School	Managers	J. Rowell, Architect, Church Lane, Boston.
No date	Cardiff—Alterations to House ... ..	...	W. Beddoe Rees, Architect, 3 Dunmores Place, Cardiff.
"	Duckmanton—Huts	Brodsworth Main Colliery Co.	Brodsworth Main Colliery Co., Duckmanton, Chesterfield.
ENGINEERING:			
Nov. 24	London, N.—Pumping Machinery	Urban District Council	Engineer, Council Offices, Finchley, N.
" 25	St. Anne's-on-Sea—Storm-water Overflow	Urban District Council	Surveyor, Council Offices, St. Anne's-on-Sea.
" 27	St. Brides Minor—Tanks	Urban District Council	Council Offices, Brynmynyn.
" 27	Dublin—Bridges, &c.	Great Northern Railway	W. H. Mills, Engineer, Amiens Street, Dublin.
" 27	Saffron Walden—Regenerators, &c.	Gas Committee	A. H. Forbes, Gasworks Manager, Saffron Walden.
" 29	West Hartlepool—Ventilator	Corporation	Nelson F. Dennis, Borough Engineer, West Hartlepool.
Dec. 1	Ingatestone—Pumping Machinery	Rural District Council	J. Clare, Surveyor, Sleaford.
" 2	Sleaford—Waterwheel, &c.	Urban District Council	W. E. Richardson, Rothwell, near Leeds.
" 4	Rothwell—Reservoir	Urban District Council	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
" 4	Dublin—Motor-cars	Great Northern Railway Co.	I. Carr, Engineer, Widnes.
" 5	Widnes—Pumping-engine	Corporation	W. D. Jenkins, County Architect, Shirehall, Carmarthen.
" 8	Cwmbach and Five Roads—Sinking Wells	Education Committee ... ..	...
1906.			
Jan. 9	Auckland—Wharf, &c.	Harbour Board	W. & A. McArthur, 150 Leadenhall Street, London, E.C.
May 1	Talcahuano, Chili—Dock	Rural District Council	Direccion de Material, Valparaiso.
No date	Congleton—Waterworks ... ..	...	W. Wyatt, Engineer, 99 Rodford Road, Leamington.
PAINTING AND PLUMBING:			
Nov. 29	Harrogate—Colouring, &c.	Hospital	Royal Bath Hospital and Rawson Convalescent Home, Harrogate.
Dec. 11	Birkenhead—Painting	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
ROADS AND CARTAGE:			
Nov. 23	Stockport—Private Street Works	Highways and Sewers Committee	J. Atkinson, Borough Surveyor, Stockport.
" 23	Harrogate—Street Improvement Works	Corporation	F. Bogshaw, Borough Surveyor, Harrogate.
" 23	London, N.E.—Road Works	Hackney Borough Council	Norman Scorgie, Borough Engineer, Town Hall, Hackney.
" 27	Brynmynyn—Limestone and Gravel	Urban District Council	Council Offices, Brynmynyn, Wales.
" 28	Bromley—Street Improvement	Council	Borough Engineer, Town Hall, Bromley.
Dec. 8	Brynamman and Cwmbach—Paving, Metalling, &c.	Education Committee	W. D. Jenkins, Education Architect, Shirehall, Carmarthen.
SANITARY:			
Nov. 23	Dinas Powis—Drainage Works	Education Committee	W. H. Dashwood Caple, Architect, Church Street Chambers, Cardiff.
" 27	Rutherglen—Sewers	District Committee	Warren & Stuart, C.E., 94 Hope Street, Glasgow.
" 30	Hanley—Sewage-disposal Works	Corporation	Willcox & Raikes, Union Chambers, Temple Row, Birmingham.
Dec. 6	Bovey Tracey—Sewerage	Rural District Council	Bresley, Son & Nichols, Engineers, 11 Victoria St., Westminster, S.W.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
1906.				
Jan. 15	Hackney—Library	50, 30 and 20 guineas	£1 IS.	W. A. Williams, Town Clerk, Town Hall, Hackney.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

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	£ s. d.	£ s. d.
Beans ... per qr.	1 11 0	1 13 0
Clover, best ... per load	3 12 0	4 0 0
Hay, good ... do.	3 5 0	3 10 0
Sainfoin mixture ... do.	3 7 0	3 15 0
Straw ... do.	1 10 0	1 16 0

OILS AND PAINTS.

Castor Oil, French ... per cwt.	1 1 10	1 2 15
Colza Oil, English ... do.	1 4 9	—
Copperas ... per ton	2 0 0	—
Lard Oil ... per cwt.	2 15 0	2 17 0
Lead, white, ground, carbonate ... per ton	16 0 0	—
Do. red ... do.	15 0 0	0 19 0
Linseed Oil, barrels ... per cwt.	0 17 10½	—
Petroleum, American ... per gal.	0 0 7½	0 0 7½
Do., Russian ... do.	0 0 68	0 0 78
Pitch ... per barrel	0 8 0	—
Shellac, orange ... per cwt.	9 2 6	—
Soda, crystals ... per ton	3 2 6	3 5 0
Tallow, Town ... per cwt.	1 6 9	1 7 6
Tar, Stockholm ... per barrel	1 5 0	—
Turpentine ... per cwt.	2 6 3	—

METALS.

Copper, sheet, strong ... per ton	£8 0 0	—
Iron, Staffs., bar ... do.	6 15 0	8 10 0
Do. Galvanized Corrugated sheet ... do.	12 0 0	12 5 0
Lead, pig, Soft Foreign ... do.	15 10 0	—
Do. English common brands ... do.	15 15 0	—
Do. sheet English, 3lb. per sq. ft. and upwards ... do.	17 0 0	—
Do. pipe ... do.	17 10 0	—
Nails, cut clasp, 3in. to 6in. ... do.	9 5 0	—
Do. floor brads ... do.	9 0 0	—
Steel, Staffs., Girders and Angles ... do.	6 15 0	7 5 0
Do. Mild bars ... do.	7 5 0	7 10 0
Tin, Foreign ... do.	152 12 6	153 2 6
Do. English ingots ... do.	150 0 0	157 0 0
Zinc, sheets, Silesian ... do.	31 7 6	—
Do. do. Vieille Montaigne ... do.	31 10 0	—
Do. Spelter ... do.	28 15 0	28 17 6

TIMBER.

Soft Woods.

Fir, Dantzic and Memel ... per load	2 15 0	5 0 0
Pine, Quebec, Yellow ... do.	4 2 6	7 10 0
Do. Pitch, American ... do.	3 1 0	5 0 0

	£ s. d.	£ s. d.
Laths, log, Dantzic ... per c. fath.	4 0 0	—
Deals, St. Petersburg, Yellow, 1st, 3x11 ... per std.	16 5 0	—
Do. do. do. do. 3x10 ... do.	8 10 0	—
Do. do. do. do. 3x9 ... do.	13 5 0	13 10 0
Do. do. do. do. 3x8 ... do.	11 0 0	—
Do. do. do. do. 2½x7 ... do.	11 0 0	11 5 0
Do. do. do. 3rd, 3x11 ... do.	8 5 0	—
Do. do. do. do. 3x9 ... do.	8 0 0	—
Do. do. do. do. 2½x7 ... do.	8 0 0	—
Do. do. White, 3rd, 3x9 ... do.	8 10 0	—
Do. do. do. do. 3x7 ... do.	7 15 0	—
Do. Quebec, Spruce, 2nd, 3x9 ... do.	9 10 0	—
Do. Soderhamn, Yellow, 3rd, 3x9 ... do.	12 5 0	—
Do. do. do. Unsorted, 3x4½ ... do.	9 10 0	—
Do. Räfsö, Yellow, 1st, 3x9 ... do.	14 5 0	—
Do. do. do. 2nd, 3x9 ... do.	12 5 0	—
Do. do. do. 4th, 3x7 ... do.	8 10 0	—
Do. do. do. 4th, 3x4 ... do.	8 0 0	—
Do. Skelleftea, Yellow, 2nd, 2½x7 ... do.	9 0 0	—
Do. Matane, Spruce, Unsorted, 3x9 ... do.	9 5 0	—
Do. Petschora, Yellow, 3rd, 3x9 ... do.	10 0 0	—
Do. Fingermanholmen, Yellow, Unsorted, 3x7 ... do.	8 15 0	—
Do. Raumo, Yellow, Unsorted, 3x4½ ... do.	7 15 0	—
Do. do. do. 3x4 ... do.	8 5 0	—
Do. Pernoviken, Yellow, 1st & 2nd, 2½x8 ... do.	8 10 0	—
Do. do. do. 2½x7 ... do.	9 0 0	—
Battens, all kinds ... do.	6 15 0	13 0 0
Flooring Boards rin. prepared, 1st ... per square	0 9 3	0 14 0
Do. 2nd ... do.	0 8 3	0 9 9
Do. 3rd, &c. ... do.	0 7 3	0 8 0
HARD WOODS.		
Ash, Quebec ... per load	3 15 0	7 10 0
Birch, New Brunswick ... do.	2 5 0	4 10 0
Do. Quebec do. ... do.	2 10 0	4 15 0
Box, Turkey ... per ton	7 0 0	20 0 0
Cedar, Cuba ... per ft. sup.	0 0 3	0 0 4
Do. Honduras ... do.	0 0 6½	—
Do. Tobasco ... do.	0 0 5	—
Elm, Quebec ... per load	4 0 0	8 5 0
Jarrah, plank ... per ft. cu.	0 2 6	0 3 0
Mahogany, Average Price for Cargo, Honduras ... per ft. sup.	0 0 4½	0 0 5½

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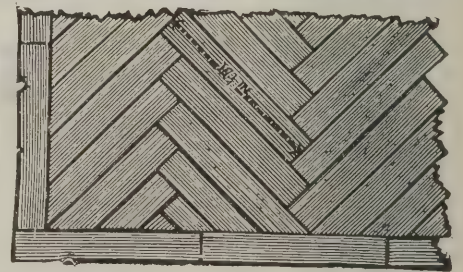
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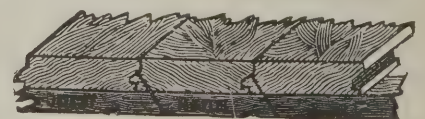
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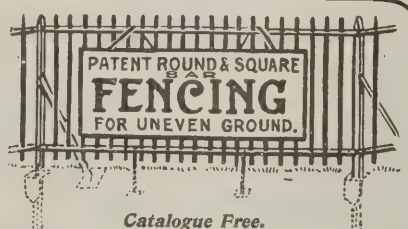
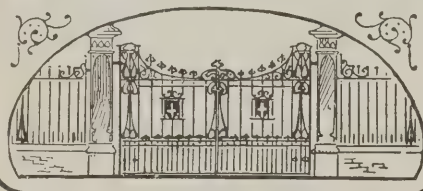
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MONTHLY FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

Edwin O. Sachs, F.R.S.Ed., Architect,
Consulting Editor.

Number 14.
November, 1905.

FIRE-INSURANCE AND FIRE- PREVENTION.

WE have before us what we believe to be one of the most excellently summarized records of last year's fires and fire-insurance in the form of a series of leaderettes in the "Post Magazine." It is a feat of extraordinary difficulty to be able to summarize this extensive subject in a few pages, and yet give a fair picture of the fires and fire-insurance situation of any given year, and this feat has certainly been attained in more than ordinary efficiency in the "Post Magazine," to which we refer our readers.

When touching on protective safeguards reference is made by this journal to the increasing popularity of sprinklers and similar appliances, also to drenchers, wire-glass, and external shutters for the reduction of the conflagration hazard, whilst the advent of the chemical engine and the motor fire-engine is welcomed as extinguishing appliances.

But what strikes us as extraordinary in this annual leading article of the "Post Magazine" is the manner in which the whole movement of fire-prevention as such has been ignored, whilst, as a matter of fact, this movement of the last seven or eight years has had a most striking effect upon the prosperity of insurance business, and has to a great extent brought about the prosperous fire-insurance years of 1903 and 1904, as far as the British business of British companies more particularly is concerned.

We, of course, know the official aspect of ignoring fire-prevention practised by many fire offices and their senior officials, an aspect which is, however, being rapidly broken down by what we may term the semi-official aspect of academic interest which is now favoured by some few of the more far-seeing of the existing managers and by a large proportion of the head-office departmental chiefs who are recruits for the coming generation of managers, whilst many of the leading branch managers and the leading insurance surveyors most wisely actively further the fire-preventive movement and assist in its furtherance both at home and abroad.

We thus think that the time has now come when the "Post Magazine," even if not seeing eye to eye with some of its older supporters, can quietly but energetically guide fire-insurance opinion in the direction of systematic fire-prevention to the benefit of the fire-insurance world; for regardless of what the official dicta may still be, there can be no doubt, practically and economically, that fire-prevention, with the reduction of unnecessary hazards, pays the fire-insurance companies extraordinarily well. News on questions of fire-prevention is already being extensively recorded in the "Post Magazine's" columns week by week, but editorial comment or advocacy are still lacking.

To put it in the negative sense, we should like to know what the fire losses in the

United Kingdom would have been during the last few years had it not been for the systematic propaganda in the interests of better planning, better construction and better equipment of buildings, including the improvement of existing risks. With the recent amendment of the Building Act, with further impending revision of the building legislation of the Metropolis, the impending revision of the Model By-laws and local enactments, with the improvement of many regulations for individual localities, not to speak of special regulations relating to factories, petroleum, theatres, &c., nearly all the outcome of the systematic fire-preventive propaganda, the insurance companies will find their business of the impending two decades far less hazardous and comparatively easier to operate, regardless of the fact of the rapidly increasing values at stake, owing to the greater quantities and superior quality of articles stored away in individual risks.

The only grave hazard that will have to be contended with during the coming two decades will be that of the conflagration hazard in old districts of large cities, in respect to which it will be difficult to apply fire-preventive legislation retrospectively, although, thanks to the fire-preventive propaganda the companies officially ignore, a precedent as far as safety of life is concerned has been set by the Building Act Amendment Act of last year by making rules for existing property. To take the average life of a building and the growing tendency towards modernizing business premises for other than fire-preventive reasons, it may, however, be assumed that a very great portion of the large business areas of our principal centres will be rebuilt in the next thirty-five years, and will then be rebuilt under the new rules and regulations which the fire-preventive propaganda has already and will have obtained.

We are of course naturally fully aware of the principles that govern the actions of certain managers, more particularly that terribly antiquated "motto" that "a risk is rated as it is found"; we are fully alive to the unwise competition of certain individual managers to show increasing "turnovers" almost regardless of the average hazard being increased. We are also fully acquainted with the ignorant demands so frequently made of insurance companies to reduce rates without a suitable *quid pro quo* having been afforded by the owners or occupiers, and without due regard to the block risk. We know only too well the apathy of the majority of architects in considering fire-insurance requirements, not to speak of actual opposition. We know similarly of the ignorant demands frequently made by certain unscrupulous fire brigades in country districts for unmerited fire charges. But, speaking generally, the fact of the existence of conservatism in certain circles, the ambitions as to turnovers, or the fact that companies are subject to such irritations as are indicated, should not affect the public and energetic furtherance of fire-prevention by the majority of insurance officials, with

the resultant improvement of fire risks generally.

We think that it is a pity rather than anything else that some of our leading commercial institutions such as our insurance concerns should still take so conservative an official view of the question of fire-prevention as to actually believe fire-prevention may negatively effect insurance profits, more particularly as this view has already been semi-officially changed in many directions and must eventually be entirely changed. It is a pity, more particularly from the point of view of the prestige of the insurance world among the building professions and trades.

The apathy in economically obvious matters such as this question of fire-prevention for insurance business has so long been our failing in other departments, which culminated at the time when the Prince of Wales made his notable call upon the community with the words "Wake up, England."

These words are being answered rapidly in various directions, more particularly in the shipping, building and engineering industries, and it is to be anticipated that they will also be eventually responded to in insurance circles. But it would be more pleasurable if this "Wake up, England" dictum were responded to a little earlier by the insurance profession than by other professions; in other words, that the insurance companies should lead in the necessary reaction from ultra-conservatism in business matters, and we trust that when we again see the "Post Magazine's" annual summary we will have observed that the word fire-prevention is no longer absent in the editorial columns, and that it will have a guiding influence in the direction which we consider essential.

The whole trend of the educational movement of the Federation of Insurance Institutes, the impending meeting of the Federation to be held for the first time in London in 1906, and the new classes of the School of Economics, all point towards the more scientific treatment of fire-insurance questions in the direction of fire-prevention in its widest sense, namely, the prevention of the outbreak of fire and the limitation of spread should fire occur.

The Professional Association of Fire-brigade Officers will hold their next executive meeting in London.

There has been a further enquiry under the Fire Inquests Act into the state of the City Mills buildings, which are such a disgrace to the Corporation's area, but unfortunately cannot be dealt with until the Building Act Amendment Act, passed last session, comes into force. The enquiry was conducted by Dr. Waldo, and arose from a small fire that recently again took place there. Dr. Waldo also conducted an enquiry under the same Act into the serious question of petrol hazards in the City area. This arose from a fire that took place on a motor vehicle carrying petrol cans.



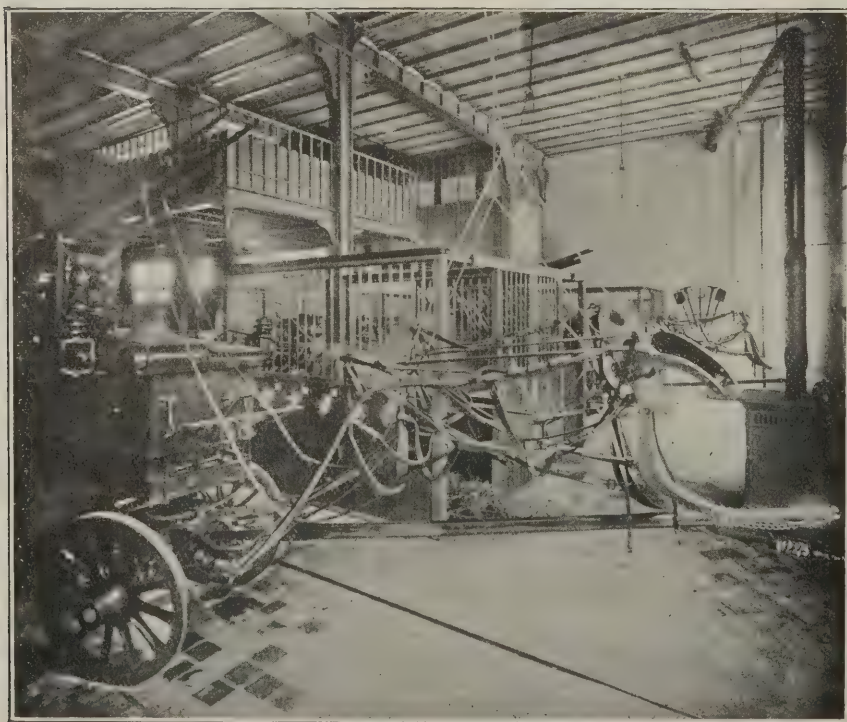
DISTRICT FIRE-BRIGADE STATION, RUE MALAR, PARIS.

PARIS FIRE STATIONS.

HAVING published various illustrations of modern fire stations erected in Germany, we are now giving two plans, an elevation and an interior view of a new fire station erected in Paris at the corner of the Rue Combes and the Rue Malar. This is a corner building designed so as to have its ground floor practically entirely occupied by the engine-room and stables, there being room for three two-horsed appliances ready to turn out and also one motor appliance. The space occupied by these appliances is clearly indicated on the plan. By referring to the plan it will be observed that the stables for the horses, although behind the

appliances, are actually in the appliance room, *i.e.*, that the stalls are really divided off by the usual stall furniture and not by partitions reaching to the ceiling. On the first floor will be seen the day room and the dormitory as well as some minor offices, and it will be observed that sliding-poles from first floor to second floor are provided, one in the day room and one in the staircase near the dormitory. The architectural rendering of the building certainly calls for comment, the whole appearance of the station being a dignified one.

We also show an interior view of another Paris fire station where the stables are in the engine-house but the stalls are situated on either side of the appliances.



INTERIOR OF A FIRE-BRIGADE STATION, PARIS, SHOWING STALLS ON EITHER SIDE OF APPLIANCES.

THE UNDERWRITERS' LABORATORIES, CHICAGO.

By William H. Merrill, Junr.

[Below we print a paper by William H. Merrill on the Underwriters' Laboratories of Chicago, in which he holds the position of organizing secretary. The underwriters' laboratories are essentially an insurance institution, for whilst in this country our great insurance corporations pay little or no attention officially to fire-prevention, the American insurance officials take up the position that it is to the interests of their corporation to prevent fire, to prevent the spread of fire, and to limit their monetary risk throughout, keeping the already extra ordinarily high rates within practicable limits and obtaining a greater turn-over than would be the case if the rates were higher than they at present are. The underwriters' laboratories were at first essentially intended for the testing of appliances, and particularly electrical appliances. It has only been of late that they have given attention to matters of building construction, and even now the attention accorded to questions of building construction is not equal to that accorded to it in this country, *i.e.*, no systematic series of tests with building construction have so far been undertaken. The great merit of the American institution is its tests in the interests of electrical safeguards, and in that direction its reputation stands very high.—Ed. B.J.]

The Laboratories.

This experimental bureau was organized in 1893, and originally devoted itself exclusively to testing electrical devices and materials and collecting accurate statistics and reports on fire losses caused by electricity. Later, its work was enlarged to include all forms of lighting and heating appliances and the testing of extinguishers, retardants, and fire-alarm signal systems of all kinds.

Up to the present time tests have been completed and reports issued on more than 2,400 separate systems, appliances and materials. The objects of these tests are to determine the comparative efficiency of all forms of fire-retarding and fire-extinguishing systems and devices, and to secure such safeguards in the construction of all lighting and heating appliances as will reduce to a minimum the hazards incident to their use.

The institution is supported financially by the stock fire insurance companies doing business in the United States, and by fees collected from the manufacturers of appliances submitted.

All tests are carried out under detailed specifications agreed to by the various national organizations representing the interests affected.

In the electrical department the specifications used are those of the National Electrical Code, which is the recognized American authority on safe wiring and safe electrical construction. This code was originally drawn, and is extended from year to year, by a convention to which the following American organizations send delegates:—The American Institute of Architects, the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, the American Street Railway Association, the Factory Mutual Fire Insurance Companies, the International Association of Fire Engineers, the National Board of Fire Underwriters, the National Electric Light Association, the Underwriters' National Electric Association, and the National Electrical Contractors' Association.

The names of such appliances as are shown by the tests to meet the specifications are printed in a list which is issued quarterly. All manufacturers whose names are given in the list are required to enter into a contract with the laboratories covering their factory

practices, and samples of all articles listed are purchased in the market from four to twelve times a year, and re-tested to discover any departure in later factory practices from the standard set forth in the requirements.

This work covers every electrical appliance in common use whose introduction may have any bearing on the fire hazard. It secures the active co-operation of all of the manufacturers in the United States, from the largest to the smallest, all of whom make a practice of submitting new appliances to the laboratories before putting them on the market. In this way hazardous features are eliminated at the outset, and the number of fire losses is correspondingly reduced.

A practice similar to that inaugurated in the electrical work has been followed in the departments since organized, and the lists of approved fire-extinguishing and retarding appliances thus far issued, like the electrical lists, are followed generally in the classifications and ratings of the insurance companies and in the specification of architects, engineers and builders. In a similar manner the disapproval of the laboratories tends to keep faulty appliances out of building equipments.

Over 30,000 copies of the quarterly electrical lists are regularly called for, the quarterly lists of permitted gas machines and systems reach 28,000 copies, and the lists of approved extinguishers, watchmen's time detectors, and other signal systems are coming into quite as general use.

Coupled with the laboratory work in all departments, careful watch is kept on the record in practice of all the appliances covered; more than a thousand correspondents located throughout the United States are reporting regularly to the laboratory organization, and prompt reports are received of the failure or apparent failure of any listed device successfully to perform service. This feature of continuous record of experience is considered quite as valuable in an instructive way as are the laboratory experiments themselves.

In the retardant work gas ovens have been built, the largest capable of reproducing the severest possible fire conditions over an area equal to that of standard-sized fire-doors. The gas used is obtained by pipe connection to the natural gas fields in the State of Indiana, a very large continuous supply being available and the gas being peculiarly well adapted for fuel.

Electrical power is used throughout the laboratories, including the hydraulic department, a recent addition being an electrically-driven fire-pump capable of delivering 500 gallons of water per minute at 100 lbs. pressure. This department, which covers the test work on hose, hydrants, valves, automatic sprinklers, nozzles and similar apparatus, is also equipped with a 5,000-gallon reservoir, a 4,500-gallon pressure tank, a 6in. standpipe 70ft. in height, and a large amount of small apparatus for pressure work and measurements.

In the department devoted to lighting and heating, other than electricity, 380 different makes of acetylene gas generators and 200 devices and appliances using petroleum and its products have been tested and reports issued.

In the electrical department examination tests and reports have been made on 1,650 different devices and materials.

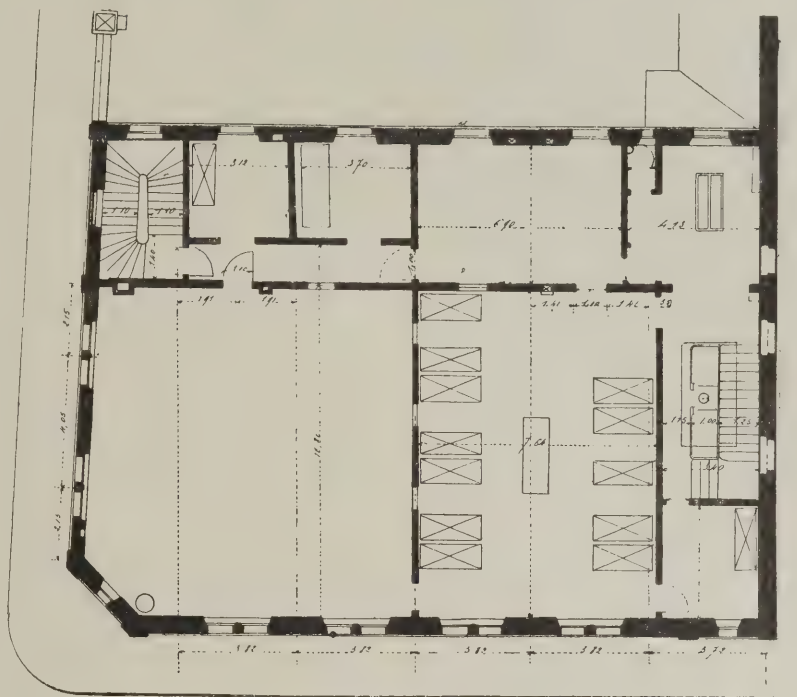
The plant at present occupies one two-storey and basement brick building with yards adjoining, and a storage floor in a second building. Six resident engineers and a total of eleven persons are constantly employed, all of whom devote their entire time to the work.

Each department is supervised by a committee of consulting engineers appointed by the various National Associations having the different subjects in charge, the members

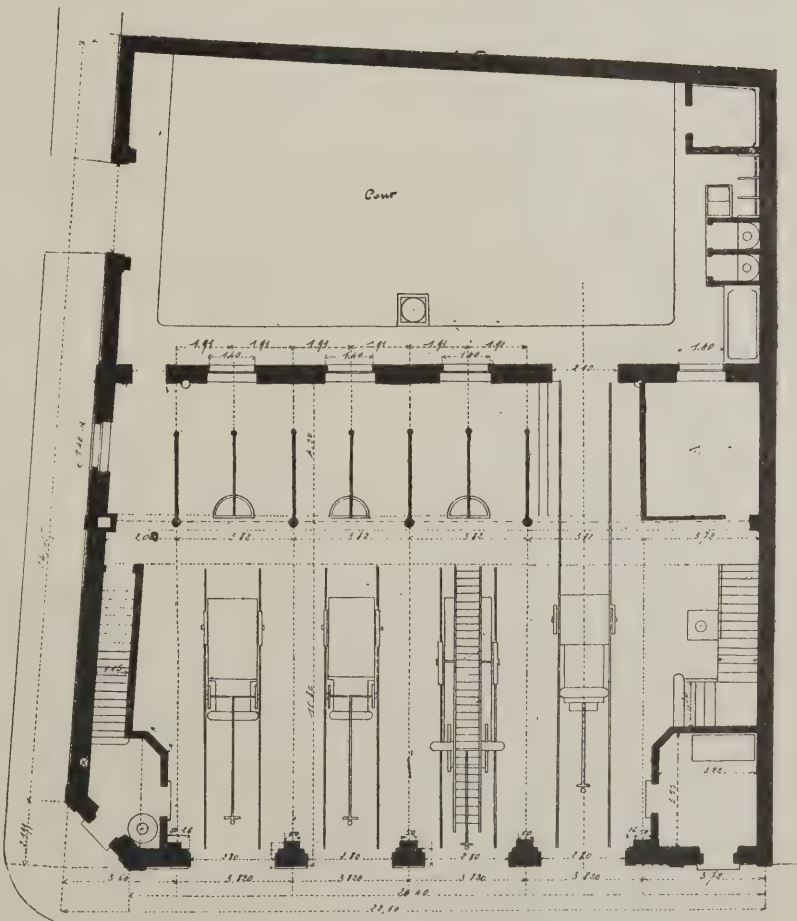
of which are residents of different sections of the United States. All laboratory reports are issued to and reviewed by these committees before being utilized as a basis for the lists of approved or permitted devices and materials issued by the National bodies.

The protective work is covered by a

committee of the National Fire Protection Association, the electrical work by the Underwriters' National Electric Association, and the work on lighting and heating, other than electricity, by the committee of consulting engineers of the National Board of Fire Underwriters.



First-floor Plan.



Ground-floor Plan.

A.—Electric motor charging appliances.

FIRE-BRIGADE STATION IN THE RUE MALAR, PARIS.

EXISTING BUILDING REGULATIONS FOR PROTECTION FROM FIRE, WITH SUGGESTIONS.

JAMES SHEPPARD, A.Inst.E.E.,
Insurance Surveyor.

(Continued from p. 35, No. 559.)

REQUIREMENTS as to openings in flues for soot doors or ventilators differ considerably in various by-laws. The least space that should be required between such openings and any combustible material is 12ins. In the cases of soot doors the London Building Act requires a distance of 15ins.

The Model By-laws, which in this respect are generally followed, provide that the back of a kitchen chimney-opening and flue in a party-wall shall be 9ins. thick to a height of 6ft. above such chimney-opening and the back of every other chimney-opening not in an external wall shall be 9ins. thick for a height of 1ft. above such chimney-opening. The London Building Act contains no provision for the back of a chimney-opening not in a party-wall, so that in the county of London these may be and are built dangerously thin. The enclosure even of a kitchen flue where more than 12ins. above the mantel may have a thickness of 4ins. only from the inside of the flue to the face of the wall in an adjoining house; this results in numerous fires, many being of a serious nature.

The distance required between any combustible substance and any pipe for conveying smoke or other product of combustion varies from 4½ins. to 14ins. in different by-laws. In some by-laws, where approved fireproof casings are used a space of 3ins. only is required, and the distance required between any timber or woodwork and the upper surface of a hearth in a chimney-opening varies in different regulations from 6ins. to 15ins. It is difficult to understand these differences, as the danger is equally great in all districts. In no case should the distance between a flue pipe and combustible material be less than 9ins., and the distance between the surface of a hearth in a chimney opening and any combustible material below should be at least 12ins.

The by-laws of many districts contain no provision with regard to the front hearths of fireplaces, and consequently these are often improperly arranged with woodwork close to the surface of the hearth. Previous to the Public Health Amendment Act, 1890, no power apparently existed for making by-laws regulating the construction of front hearths, and many regulations have not been revised since that date. It is important that hearths in front of fireplaces should be constructed with incombustible material, as provided in the London Building Act, s. 64 (15), (16), (17), except that slate should not be used for hearths. Hearths of incombustible and non-conducting material at least 6ins. thick, extending 18ins. all round, are usually required under every oven, copper or stove. Gas stoves are unfortunately excluded in the London Building Act, s. 66, but gas cooking stoves have been known to set fire to woodwork upon which they have been placed. Some by-laws further require an air-space of 2ins. below the ashpan and between it and the incombustible hearth. To secure all the advantages this air-space affords it is necessary to keep it free from all accumulation, which is impossible in practice. Solid incombustible non-conducting material is therefore preferable.

Building by-laws usually forbid the placing of timber or woodwork in any wall or chimney-breast nearer than 9ins. to the inside of any flue (the London Building Act requires 12ins.), but the Glasgow Building Regulation Act, 1900, s. 86 (5), and some other by-laws, allow timber or woodwork to be built into a wall as near as 4½ins. to the inside of the flue. It is somewhat surprising

to find such a dangerous practice sanctioned in the Glasgow regulations, which in most other respects are in advance of other by-laws.

Nearly all building laws and by-laws allow wooden plugs to be driven as near as 6ins. to the inside of a flue, and iron holdfasts as near as 2ins. Both of these are objectionable and the cause of fires. In driving a wooden plug into brickwork surrounding a flue it is difficult to prevent displacement (which cannot be seen or repaired) of bricks and plastering on the inside of the flue, causing cavities in which soot collects and ignites, setting the wooden plug on fire, which spreads to any woodwork attached thereto. A fire from this cause occurred at Her Majesty's Theatre, Haymarket, and plugs driven into brickwork round flues for the fixing of wood linings to walls have caused many fires in city warehouses.

Iron holdfasts or other iron fastenings having one end 2ins. only from the inside of the flue, and the other in contact with wood, through which it may have been driven, conducts heat to the wood, which accumulates it sufficiently to cause ignition under favourable circumstances. This occurred at a London mansion, where woodwork round a spike fixed in the way described was ignited, the fire being discovered and extinguished early enough to show its real cause.

In a City printing establishment woodwork in contact with a steel joist was set on fire by heat conducted along the joist for a distance of 2ft. from its end, which rested in a flue from a stereotyping furnace.

In a country house a fire was caused by a tie rod fixed to wood joist on first floor and through the flue from kitchen range to a tie-plate on the outside of chimney stack. A girl was burnt to death beyond recognition by this fire.

At some works on the Thames the heads of timber piles embedded in clay 2ft. 6ins. below the hearths of a bed of pyrites burning furnaces, were completely carbonized by heat conducted through the above depth of concrete and brick arches to iron girders resting on the heads of the piles.

A small house in Bethnal Green was set on fire by heat conducted through spikes driven into brickwork round a flue of the adjoining house, for the fixing of the string of stairs. By this fire ten lives were lost.

The foregoing are sufficient to show the danger of placing woodwork against any iron which may be subject to fire heat at any point. The usual practice of running steel joists for concrete floors into flues and placing wooden bearers and floor boards on the steel joists should be avoided, and the metal joists trimmed round flues as now required for wood joists.

Many fires involving loss of life result from the careless setting of stoves and chimney-pieces at the back of which vacant spaces are left, where soot collects and becomes ignited, communicating fire to the skirting and floor or other combustible material near. A rule should be inserted in all building laws and by-laws requiring stoves and chimney-pieces to be set perfectly solid with suitable incombustible material. Coke-breeze concrete should not be used for this purpose, as in such position it has frequently been found to be in an incandescent condition. Disastrous fires, the causes of which could not be traced, have doubtless originated in this way. Regulations to guard against these dangers are not so far as is known contained in any existing building law or by-laws.

Chimney-openings and flues not used for the purpose for which they were constructed are frequently the cause of disastrous fires. Such openings and flues when stopped with boarding or other combustible material collect soot, dust and light refuse, which fall down the flue; these accumulations are often ignited by a spark passing through a defective division between the disused flue and an adjoining flue in use, or by a spark from a chimney near, or from a fire in the neighbourhood falling down the flue. The flues from all unused fireplaces should be closed with brickwork 9ins. thick immediately above the chimney opening, and the

top of flue closed by a stone or tile. If the flue is required for ventilation, a suitable cowl or other appliance that will effectually prevent the entrance of sparks should be fixed. All such ventilating flues should be cleaned out every twelve months. The Glasgow Building Act, 1900, is probably the only regulation containing provision to guard against the serious danger resulting from disused chimney-openings and flues.

In London and Dublin hot air and high pressure steam pipes are required to be 6ins. from any combustible material, and high-pressure hot water pipes 3ins. distant. Only a few by-laws contain provision of this nature, but it is desirable that they should have general application.

The London Building Act requires the floors of rooms over furnaces and ovens, if within 18ins. of the crown of the oven or furnace, to be of fire-resisting material. This rule should be included in all by-laws.

The regulations of only two cities, London and Glasgow (so far as is known), contain provision with reference to adapting existing flues for any new oven furnace, cockle steam boiler or close fire, used for any purpose of trade or business, or to or for the range or cooking apparatus of any hotel, tavern or eating-house, unless the flues be surrounded with brickwork at least 8½ins. thick, from the "floor on which such oven, &c., is situate, to the level of the ceiling of the room next above the same," and in one of the cities, very properly, higher if required by the authorities. The danger arising from using old flues for new furnaces is the same in all cases, and provision with regard to such objectionable practices should have general application. Several country hotels have been recently burnt down with loss of life; these fires may have originated from the use of existing flues not meeting the requirements of above regulations.

Fires frequently result from the defective fixing of gas pipes and the improper use of soft metal or rubber tubing, and fires caused by ignorant or careless work in connection with electric light or power conductors and fittings are rapidly increasing in number. Appliances in connection with acetylene gas are also a source of danger to life and property. It is desirable to control each of the foregoing by suitable regulations in all building by-laws. Glasgow Regulations (s. 113) provide for the control of electric-light installations; power installations should be included.

The tables on page 45 give, in the terms used in the annual official reports of the chief officers of the fire brigades of the cities named, the number of fires caused by defective construction in the respective districts, showing that such fires amount to a large proportion of the total number included in the returns.

Taking only the fires for which causes are recorded, the proportion of the total of such fires resulting from defective construction in each case, for the five years 1897-1901, is as follows:—

London	-	-	-	15.4 per cent.
Liverpool	-	-	-	17.0 "
Glasgow	-	-	-	42.5 "
Manchester	-	-	-	13.7 "
Birmingham	-	-	-	27.3 "
*Dublin	-	-	-	27.0 "

* Four years, 1898-1901.

The above proportions are probably below the true percentages, especially in London, where the proportion of fires the causes of which are unknown are from 3 to 5 times greater than in some other cities. A far larger proportion of the fires the causes of which are returned as unknown result from defective construction than is the case with fires the causes of which are ascertained. Fires of unknown origin moreover comprise nearly all disastrous fires and conflagrations, which usually destroy all evidence of their cause.

The large proportion of fires in Glasgow

arising from defective construction is explained by the practice in that city, up to 1892, of placing timber and woodwork in close proximity to the inside of flues or chimney-openings and the surface of hearths. The application of provisions in the Acts and by-laws of 1892 and 1900 will no doubt gradually reduce such heavy proportion, but to secure this to the fullest extent it will also be necessary to bring the Glasgow regulations into line with those of most other cities, and require a distance of at least gins. filled with solid brickwork between the inside of all flues or chimney openings and any timber, woodwork or other combustible material, and require the outer face of brickwork about such flues or chimney-openings within the building to be plastered.

(d) Rules adopted with the view of retarding the spread of fire throughout the building in which it may originate, and for preventing its extension to surrounding buildings.

The general construction, thickness, recesses, chases and piers of the walls of buildings as provided in building regulations are usually sufficient to guard against the spread of fire from collapse of the building or walls, but the use of stone should be discouraged by requiring greater thickness than is provided in most by-laws. The erection of buildings on accumulations of ashes, slack or furnace slag should be forbidden, as underground fires or decomposition occasionally occur amongst such substances.

The cubic capacity and height of a building are important factors governing the spread of fire, but apparently the building regulations of only three cities contain any restrictions on the extent and height of a building.

The Liverpool Fire Protection Act, 1843, restricts the size of a warehouse to an area of 4,000 super. ft. and a maximum height to the eaves of 65ft. The extent of sheds are also restricted.

The London Building Act, 1894, restricts the extent of a warehouse building to 250,000 cub. ft.; this is an addition of 34,000 cub. ft. to the capacity allowed in the repealed Act of 1855, and the present restriction is far more limited in its application, as the former Act applied the restriction as to size to "buildings used wholly or in part for the purpose of trade or manufacture" as well as to warehouse buildings.

Buildings in London are restricted to a height of 80ft., exclusive of two storeys in the roof, and in new streets less than 50ft. wide the height of a new building is restricted to the distance between the new building and the nearest wall of the building opposite. The authorities have powers in stated conditions to sanction additions to above rules up to 450,000 cub. ft. if less than 60ft. in height.

In Glasgow buildings of the "warehouse class," which term in Glasgow has a far wider application than in London, are restricted to 350,000 cub. ft., with power to sanction up to 750,000 cub. ft. in certain conditions. The height of buildings is generally restricted to that of 1½ times the width of the street, in no case exceeding roof. from the level of the street to the ridge of the roof; tenements and dwelling-houses must not exceed in height the width between the building lines of the street upon which they abut.

Several buildings adjoining or in close proximity to one another, each being of the smaller capacity named, involve great danger of most serious conflagrations unless stringent regulations as to external iron doors and shutters, party-walls and other special provisions are adopted, as in the Liverpool Fire Prevention Act.

If the owner of a building requires it to be of such extent and height that it would in case of fire seriously endanger surrounding premises, it is only reasonable that he should

be required to make every possible provision to guard against such damage to his neighbours.

Party-walls and their height above roofs constitute an important provision against the spread of fire. This in London in the case of a "warehouse building" exceeding 30ft. in height must be 3ft. above the roof, flat or gutter of the highest building adjoining, and in other cases 15ins., and in all cases 12ins. higher and wider than any turret, dormer, lantern light, &c., within 4ft. from such party-wall, and above any part of any roof opposite and within 4ft., and must project 4ins. beyond eaves and wood cornices.

The above provisions agree with corresponding provisions in the Model By-laws, but have not been found sufficient to prevent the spread of fire, especially where curb or mansard roofs covered with slates and zinc have existed near the burning building. In most provincial towns the restrictions are less stringent, and in some cases the building of party-walls up to the roof covering only is allowed.

The height of 3ft. for party-walls should apply to all the party-walls of a building any portion of which may be more than 30ft. in height so as to provide reasonable protection between roofs and skylights forming part of the building that may be at a lower level than 30ft.

The form and covering of the roof is quite as important as the height of party-wall, but this has received but little attention. In London the pitch of the roof of a "warehouse building" is restricted to 47 degs. with the horizon, and of other buildings 75 degs., and must in all cases be covered with slates, tiles, metal or other incombustible material. The regulations of other cities only provide that the covering must be of incombustible material. In Glasgow, if the roof has a steeper pitch than 45 degs. parapets or provisions for firemen being upon such roof must be provided. In London every dwelling-house or factory exceeding 30ft. in height, and having a parapet, must have means of access to the roof. There appears to be no rule requiring a parapet to be provided.

The foregoing regulations permit of very large quantities of combustible material being placed in a way that allows of its rapid burning on the highest part of a building covered only with slates or zinc, which, experience shows, are insufficient to prevent the ignition of the woodwork they cover. To obtain reasonable protection in districts crowded with warehouses flat solid roofs are needed. If others are allowed, they should be constructed entirely of incombustible material covered with tiles or copper.

In London openings are allowed to be made in party-walls subject to stated conditions, but such openings are required to be protected by two iron doors, one on each side of the wall. The regulations with regard to such openings and doors would be greatly improved if the use of stone for jambs and heads were forbidden, in place of being specially permitted, and a regulation inserted requiring the provision of bolts for securing the doors to the iron frames in the centre, top and bottom, with lugs on the hinge side of the door fitting into slots in the frame on the closing of the door. In the case of large doors additional fixings of this nature should be required. This would prevent the warping of the doors under the action of heat and avoid most of the failures that frequently occur with iron doors.

The Liverpool Fire Prevention Act and the Glasgow Building Act, 1900, contain similar provisions to the foregoing for openings and iron doors in party-walls, but as limitation of cubic capacity is not usual in other by-laws, provisions as to iron doors are not made.

(To be continued.)

City.	Total number of fires.	Percentage of total number of fires.	Number and percentage of fires of which cause known.
LONDON.			
Defective construction - - - - -	1,882	10.5	1,882 15.4
Other causes known - - - - -	10,354	57.5	10,354 84.6
Causes unknown - - - - -	5,704	32.0	— —
	18,000	100.0	12,236 100.0
LIVERPOOL.			
Defective flues and hearthstones - - - - -	244	6.3	— —
Overheat of furnaces, kilns, stoves - - - - -	191	4.9	— —
	435	11.2	435 17.0
Other causes known - - - - -	2,126	54.6	2,126 83.0
Causes unknown - - - - -	1,330	34.2	— —
	3,891	100.0	2,561 100.0
GLASGOW.			
Defective vents, flues or fireplaces - - - - -	949	27.5	— —
Heat from boiler, flue, stove, furnace or oven - - - - -	144	4.3	— —
Timber under or near hearth - - - - -	190	5.7	— —
	1,283	37.5	1,283 42.5
Other causes known - - - - -	1,733	50.6	1,733 57.5
Causes unknown - - - - -	410	11.9	— —
	3,426	100.0	3,016 100.0
MANCHESTER.			
Timber too near flues and fireplaces - - - - -	280	12.0	280 13.7
Other causes known - - - - -	1,759	75.5	1,759 86.3
Causes unknown - - - - -	290	12.5	— —
	2,329	100.0	2,039 100.0
BIRMINGHAM.			
Furnaces, ovens, muffles and stoves - - - - -	111	4.3	— —
Timber too near flues, fireplaces, heating apparatus, gas-engine exhaust and hot-water pipes - - - - -	548	21.3	— —
	659	25.6	659 27.3
Other causes known - - - - -	1,757	68.3	1,757 72.7
Causes unknown - - - - -	156	6.1	— —
	2,572	100.0	2,416 100.0
DUBLIN. (Four years 1898-1901.)			
Defective construction of flues and fireplaces - - - - -	98	18.3	98 27.0
Other causes known - - - - -	264	49.2	264 73.0
Unknown - - - - -	174	32.5	— —
	536	100.0	362 100.0



COLSTON AVENUE FIRE, BRISTOL (NOVEMBER 4TH).



DIGHTON STREET FIRE, BRISTOL (OCTOBER 25TH).

FIRES AT BRISTOL.

BRISTOL has been subjected to several serious fires during the last few weeks, and we are illustrating a plan and two views of the fire that occurred off King's Square, and also a photograph of the fire at Messrs. Pickford's premises.

We are indebted to Mr. Charles E. Goad for the plan of the major portion of the site of the King's Square fire, which attacked the premises on both sides of Dighton Street.

The King's Square fire started on Wednesday, October 25th, 1905, and was first observed about 5 a.m. Information was given by a police constable to the Central Fire Station at 5.30 that a fire was well alight in St. James's.

Two factory buildings, each of five floors, one used for the manufacture of clothing and the other of bookbinders, were very quickly fully involved and eventually entirely destroyed; the walls fell into the streets and crushed buildings on the opposite side of the narrow lane, known as Princess Row.

Both factories were constructed with timber beams and open joist floors supported on iron columns and covered with timber-slatted roofs. Lifts passed through the floors.

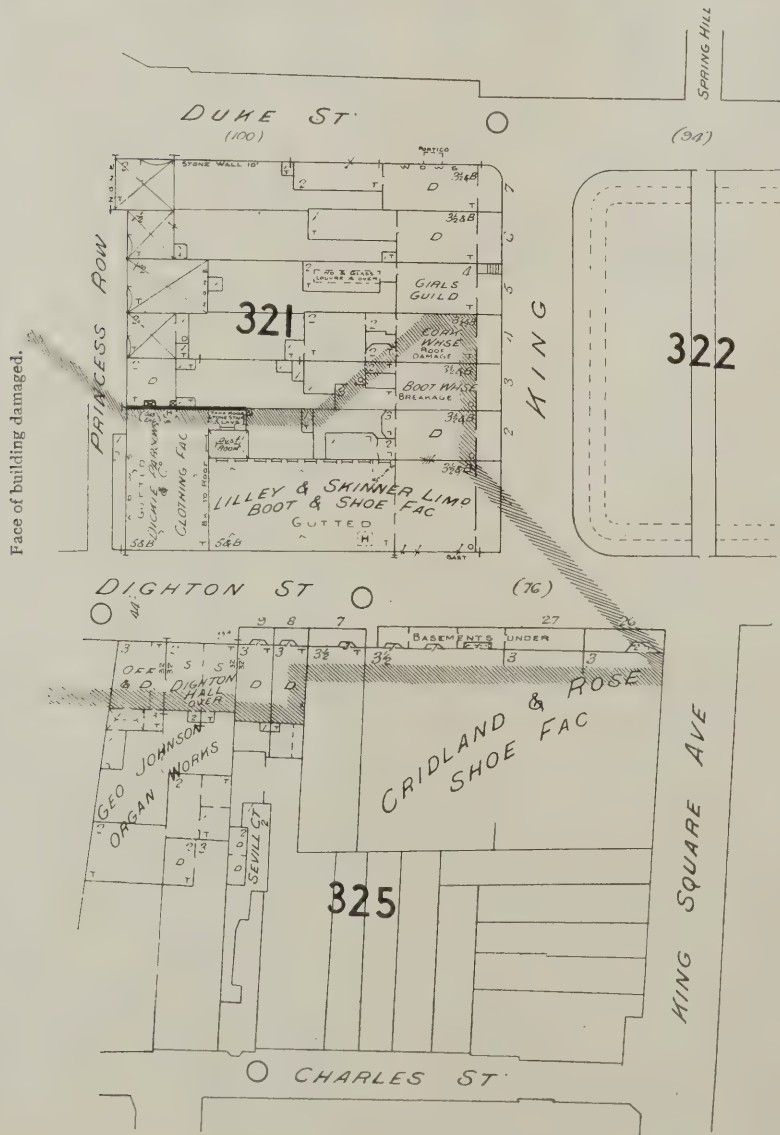
The stone steps of stairs through all floors in each factory have all fallen, but the brick wall partly enclosing these stone stairs remained standing after the fire.

The wall separating the factories was very imperfect, not being apparently in accordance with the building regulations in force when it was erected.

The lax administration of existing building regulations as demonstrated in this fire, together with the absence of a duly organized fire-alarm system in a city like Bristol, is not creditable to the authorities, resulting as it does in excessive destruction of property and the throwing out of employment of hundreds of workpeople, many of whom may be thrown on the rates.

It is also probable that the size of mains and pressure of water were in this position both insufficient for the control of fire in buildings of the character of those destroyed.

The extent of the fire is indicated on the plan annexed, but much damage has also been caused by smoke, water and breakages outside the limit shown.



PLAN OF FIRE, KING SQUARE AND DIGHTON STREET, BRISTOL (OCTOBER 25TH, 1905).
BY CHARLES E. GOAD C.E.

Regarding the second fire of November 4th, the premises were situated in a block lying between Host Street and Colston Avenue, and involved those of a well-known firm of carriers and a firm of printers whose premises were adjoining, the distance between the two streets being about 110ft., which figure gives the depth of the blocks in question. We also do not consider this fire at all creditable to the city of Bristol.

In the second fire the total loss may be computed at about £35,000, of which £25,000 were lost in property to which the fire spread, *i.e.*, in risks adjoining the scene of outbreak.

In the first-named fire the loss may be computed at about £45,000, and here again £35,000 may be considered to have been lost solely to the fact that the fire spread beyond the building in which it originated.

It is when fires of this kind occur, involving a substantial loss of property through causes easily avoidable, that the nation feels the absence of any machinery for an immediate independent official enquiry as to the reason of such fire waste. For individual firms to boast that they are insured, and for insurance companies to pay promptly the losses involved, in no way discounts the fact that the community has lost a large amount of money which it has to contribute as insurance premiums at a higher rate than would be necessary if proper safeguards were adopted.

Apart from the direct loss, there is a considerable indirect loss—loss of business, loss of employment—and such fires frequently result in the unemployed being put upon the rates, which again creates a further tax upon the community.

FIRE TESTS.

A Roller Shutter from the United States.

A REPORT has been issued by the British Fire-Prevention Committee (No. 100) in respect to a steel roller shutter door, known as Messrs. Arthur L. Gibson & Co.'s "Kinnear" door (made in the United States), and this test has demonstrated the possibility of constructing a light roller shutter door on principles by which the expansion of the metal is provided for, so that the shutter does not break away under stress of fire.

The test undertaken was with a roller shutter that covered an opening measuring 9ft. by 9ft., *i.e.*, an opening larger than that permissible under the London Building Act. The nett result of the test was that the shutter stood up but bulged, the bulging being due to the flame coming over the top of the shutter. No flame whatever actually got through the shutter or the joints in its surface.

The test was one for 1½ hours under the usual conditions of the Committee, the temperatures rising to over 1,800 degs. Fahr.

We understand some further tests are to be conducted in January with doors of similar construction, both single (automatic) and double. We give an illustration of the door which appears in the reports referred to.

Concrete Aggregate Tests.

The Committee in the course of the last week of October undertook the series of important fire tests with seven different forms of concrete in general use to which we referred in our last supplement. The object was to obtain definite information as to their comparative fire-resistance.

The sub-committee in charge of the test comprised Mr. Max Clarke, F.R.I.B.A. (directing member); Mr. J. Herbert Dyer (vice-president, National Fire Brigades' Union); Lieut.-Colonel Winn, R.E.; Mr. A. T. Walmisley, M.I.C.E. (Dover Harbour Board); Messrs. Dicksee, F.R.I.B.A., and Grellier, F.R.I.B.A., (district surveyors); Mr. Oswald C. Wylson, F.R.I.B.A.; Mr. E. J. A. Fulkes (Royal Insurance Co.), and Mr. Garbutt, A.M.I.C.E. (Metropolitan Railway).

The concrete floor bays under investigation,

as already reported in detail, comprised bays of (1) slag concrete, (2) broken-brick concrete, (3) granite concrete, (4) burnt-ballast concrete, (5) coke-breeze concrete, (6) clinker concrete, (7) Thames ballast concrete; the cement used being British "Ferrocrete" cement provided by the Associated Portland Cement Manufacturers, Ltd., who co-operated in the arrangement of the test, the load on each bay being 2 cwts. per ft. super. The test was of three hours' duration at temperatures up to 1,800 degs. Fahr., followed by the application of water from two branches of a steam fire-engine for three minutes.

Pending the official detailed report, the following may be roughly taken as the general result of the test, namely, the decisive failure of Thames ballast concrete as a fire-resistant and the success of the clinker, broken brick, coke-breeze and slag concrete bays.

We think the test should have gone on for four hours, when the result would have been more decisive to the lay mind, for no doubt by that time the Thames ballast bay would have entirely collapsed.

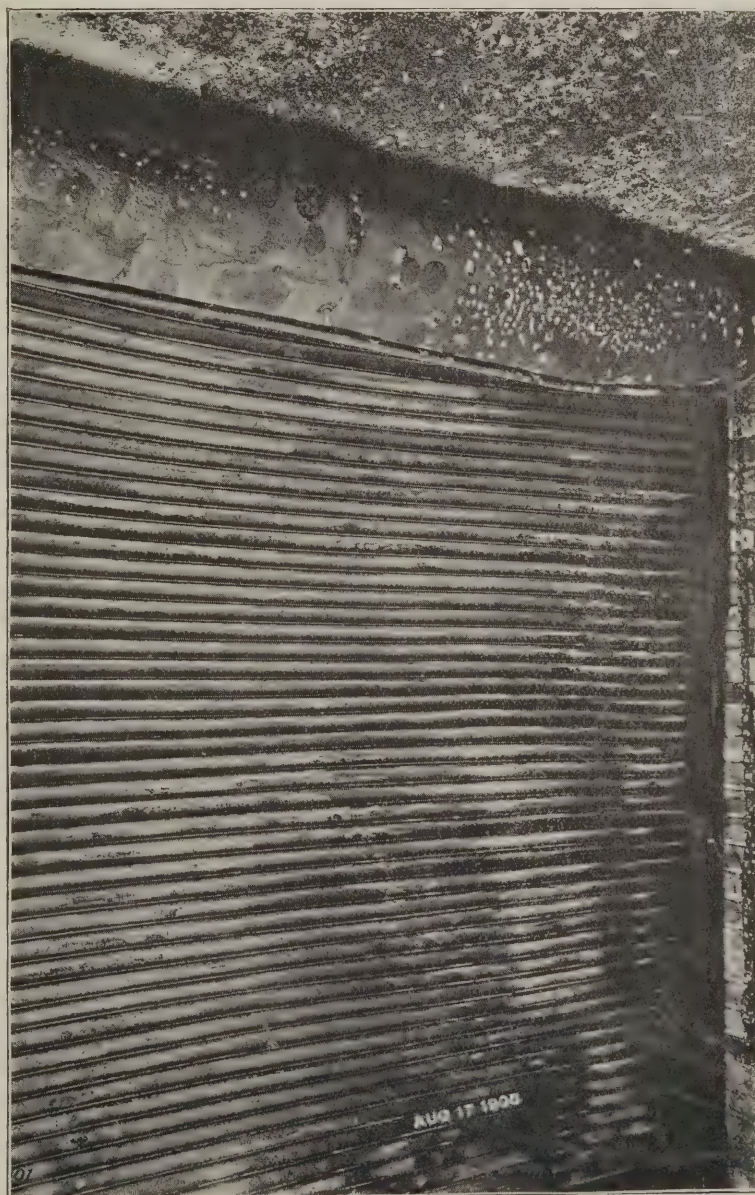
Other Tests.

The other testing operations during the week in question further included one with a floor, one with ceiling slabs and one with four stanchion encasements.

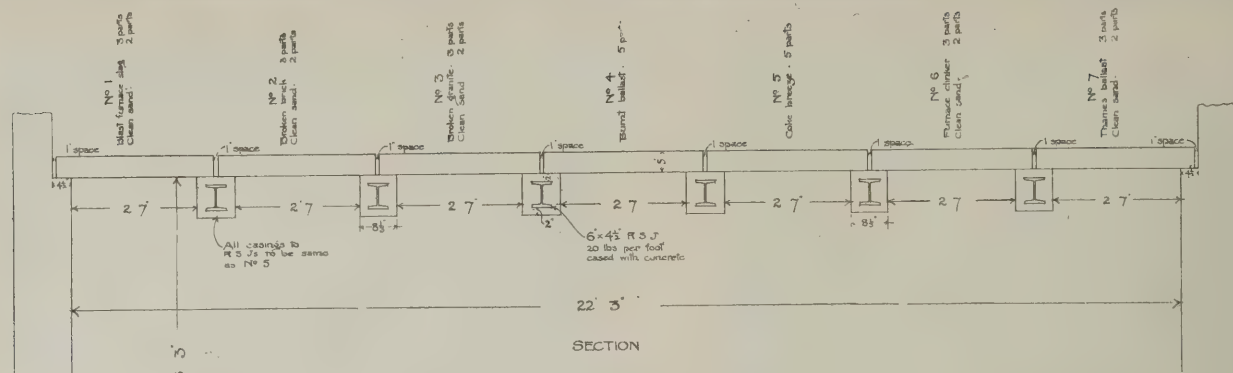
The floor was of reinforced concrete constructed on the Coignet system, measuring 22ft. by 15ft., and divided into three bays. The test was for classification as "fully protective" (Class A.), which requires that fire and water shall not pass through during the test of 2½ hours duration at temperatures reaching over 1,800 Fahr., followed by the application of water from a steam fire-engine for two minutes, the superimposed load being 2 cwts. per sq. ft. The floor attained classification, but deflected several inches. The test was carried on to three hours, the load being 2½ cwts., *i.e.*, under conditions exceeding those for the above classification.

The test with ceiling slabs was with zin. Cullum pumice slabs applied for the protection of ordinary wood joist floors, the test being for purpose of classification as affording temporary protection (Class A.), *i.e.*, which classification requires a test of three-quarter hours duration to a temperature exceeding 1,500 degs. Fahr., followed by the application of water for two minutes. Neither fire nor water reached the wood joists, and the ceiling slabs attained this classification.

The tests with the stanchion encasements were with four stanchions protected by four different kinds of porous brick encasements (two circular and two square) on the Jabez Thompson system, the test being of 2½ hours' duration, followed by the application of



"KINNEAR" ROLLER SHUTTER DOOR AFTER 1½ HOURS FIRE TEST (SEEN FROM INSIDE).



DETAIL OF CONCRETE AGGREGATES FIRE TEST, SHOWING THE BAYS UNDER INVESTIGATION.

water for two minutes, the stanchions to be loaded. Three out of the four stanchion encasements afforded protection, two round and one square.

The directing members of the sub-committees in charge of these three tests were respectively Mr. Ellis Marsland (district surveyor), Mr. James Sheppard, A.I.E.E. (insurance surveyor), and Mr. Oswald C. Wylson, F.R.I.B.A. The official reports will be issued in due course.

Impending Tests.

The following impending tests were officially announced, namely:—(1) A second experimental test by the Committee with a concrete floor of broad flange girders with cross joists, no cleats or bolts being used; (2) a second test by Messrs. Coignet, of Paris, with a reinforced concrete floor, to be constructed under the new fire office rules; (3) a floor by the New Expanded Metal Co., arranged to demonstrate the fire-resistance of certain girder encasements; (4) two roller shutter doors of the "Kinnear" type by Messrs. Arthur L. Gibson & Co.

THE INDIANAPOLIS CONFLAGRATION.

By T. M. Goodloe.

THE fire at Indianapolis, U.S.A., which occurred this year, as far as can be ascertained originated in the kitchen of a hotel and immediately communicated by means of windows on the first floor to a wholesale millinery house composed of two buildings. Above the window through which the fire was communicated was a large areaway, or light shaft, running from the first floor to the roof, and the building being fully stocked with spring goods, preparatory to their spring opening to have been held the following day, it was a matter of only a few minutes before the entire building was burning.

The heat was so intense as to ignite the frame windows in two buildings across a 40ft. street on the east. These fires, however, were soon extinguished. On account of numerous unprotected openings in the south wall of the millinery store, and also in the buildings adjoining and exposed on the south, it was seen at once that it would be impossible to save the buildings fronting on Louisiana Street, and the efforts of the department were devoted to preventing the fire spreading north.

The building adjoining the millinery store on the north was occupied by the A. Kiefer Drug Company, a fully standard equipped plant, with water supplies from 4in. connection from the city mains and an 18,000-gallon gravity tank. Adjoining the Kiefer Drug Company on the north was the wholesale millinery house of Griffith Brothers, with no protection except automatic alarm, all floors being pierced by two light shafts, two elevator shafts and one stairway, unprotected. On account of the south-west wind, which,

however, was not strong, the flames were fanned against this five-storey millinery house of Griffith Brothers, and the composition roof thereon soon ignited; in a very few minutes this building was entirely ablaze, the flames quickly spreading to the adjoining building on the north, occupied by druggists' sundries, by means of the hot walls. In the meantime an explosion (caused no doubt by the intense heat of the walls on either side of the building) occurred in the Kiefer drug risk, blowing a hole in the south wall about 40ft. long on the third floor.

All this happened within twenty minutes, making the fire much beyond the control of the local fire department. After a hurried consultation between the assistant chief and the chief, it was decided not to use the steamer for the steamer connection of the sprinkled risk, thinking that the engine could better be used towards preventing the spread of the fire across the alley on the north, rather than attaching to a connection in a building that seemed already doomed. The department was successful in preventing the spread of fire across the alley, there being 30 per cent. water and smoke damage in building 234-6, South Meridian Street, and 60 per cent. smoke damage on millinery stock in 221-3, McCrea Street.

The walls in the entire block were alight, those between the Fahmley & McCrea millinery house and Kiefer drug risk being 16-16-12-12-12, and the walls between the Kiefer drug risk and the millinery house on the north being 12ins. all the way up. The wall between the millinery house and the druggists' sundries on the north was 16ins. all the way up. Thus, it will be seen that the sprinkled risk was destroyed because of the lightness of the walls on either side. The fire went through the solid walls between 238 and 240, South Meridian Street, between 234 and 236, and between 230 and 232.

In the wall between 228 and 230, South Meridian Street, and 225 and 227, McCrea Street, there were seven old windows covered with corrugated iron and plastered over. This wall was supposed to be a solid wall. The fire, however, did not get through these openings, strange as it may seem, although it did spread to the building 221 and 223, McCrea Street, which is some 50ft. west of where the fire started.

"The natural conclusions from the fire, or rather the most reasonable ideas to be formed, are that interior protection, no matter how good, is of no service in a risk when separated by thin walls from adjoining risks when such adjoining risks are seething furnaces. The spread of the fire only emphasizes the necessity of protecting vertical openings, building heavier party-walls in congested districts, and last, but not least, outside protection in sprinkled risks. This latter has evidently been overlooked in most cities, as we find numerous other risks here and elsewhere thoroughly protected inside but with nothing on the sides or roof to protect the property against the ravages of fire and heat in adjacent properties."

Correspondence.

Lift Wells in Buildings.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The subject of the prevention and alleviation of fire is admittedly a very important one, particularly in London, and I therefore venture to hope that you will kindly find space in your valuable paper for this letter, in which I propose to call attention to a fact which, although perhaps well known to those who have experience of fires, is yet, I fear, quite unknown not only by the general public but by the majority of the great body of architects and surveyors.

It has always been the custom to regard a staircase or a lift well as the most dangerous part of a building in case of an outbreak, because as there is always a draught therein the fire rises with great rapidity and frequently cuts off all communication and means of escape by stairs or lift as the case may be.

I would, however, point out that such a well being a necessity in a building, it is very advisable to let it be as clear as possible from the lowest floor to the top, so that if a fire does break out and attacks the well (as it invariably does sooner or later) the flames may be able to rush up the well without any serious check and vent themselves vertically and not be driven out horizontally.

If this point be always kept in mind when planning a building I feel sure that a great deal of damage and loss of life would be averted, especially in London, where there is an efficient fire brigade generally on the scene of conflagration within a few minutes of the outbreak.

Let me give you a recent case by way of example. A short time ago a fire broke out in a large building in the City. The cause appears to have been the fusing of an electric cable, and the fire started in the basement and went up the lift well. Now it happened that the lift was at the top of the well and the roof above was comparatively a stout one. What was the result? The flames, checked by the left cage and the roof, diverged horizontally on reaching the top floor and found their way along the corridor for a distance of 50ft. or 60ft.—on the floor below to a shorter distance, on the floor below that to a shorter distance still, and so on floor by floor down to the ground floor, where there was comparatively little damage done. It happened that the fire brigade were on the scene within about a minute of the outbreak and quickly checked the fire, and it was in consequence of this that exact observations could be made.

My contention is that if the lift had not been at the top, and the roof instead of being a stout one had been an ordinary skylight, the damage done would have been much slighter to the corridors, and the fire would have been practically confined to the lift well.—Yours truly,

WALTER E. MARKHAM.

LONDON, N.

THE
BUILDERS' JOURNAL
AND ARCHITECTURAL RECORD.

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6, Great New Street, Fetter Lane, E.C.

Summary.

In constructing high office buildings, or skyscrapers, three methods are available—masonry, steel framework, and reinforced concrete. Masonry has its limits, by reason of the thickness of wall required at the base, and it is not practicable to build skyscrapers in this way to more than ten or twelve storeys. Skeleton steelwork has no such limitation, but in respect to the essential part—the actual support or column—the greatest care is needed in calculating stresses, and in framing columns and their connections. In reinforced concrete the first skyscraper was the Ingalls building at Cincinnati, begun in 1902. This is 50ft. by 100ft. on plan and sixteen storeys high, reaching 210ft. above the pavement. (Page 306.)

Three Italian architects have been appointed to complete Count Sacconi's huge monument to Victor Emmanuel at Rome. (Page 317.)

The Society of Architects has given fifty guineas to the Architects' Benevolent Society. (Page 317.)

Wallpaper Manufacturers, Ltd., the huge combine with a capital of £3,200,000, has made a profit of £243,227 during the past year, and the directors recommend a dividend on the ordinary shares at the rate of 8 per cent. The company has purchased the Lincrusta business of Messrs. Frederick Walton & Co., Ltd. (Page 314.)

Mr. Dawber offers to all members of the Architectural Association a hearty welcome to his "At Home" on December 8th. (Page 311.)

In Sweden to-day there are three tendencies among architects: first, the "eclectic" school, who go where they think the suggestions for the problem in hand are the best—one day Italy, next the Isle de France or England, or maybe Spain; secondly, the "national" school, who contend that the only way is to continue the tradition of their own country reverently and intelligently; and thirdly, the "individualistics," who probably include the most resourceful of the designers, even if some of their work is so new that the shock when first seen is difficult to get over. (Page 309.)

The work of restoring the church of St. Columb Major, Cornwall, has now been completed under the direction of Mr. G. H. Fellowes Prynn. (Page 317.)

Ten architects have been selected to submit designs in the competition for a secondary school and technical institute at Luton. (Page 309.)

Mr. A. W. Mills, architect, of Manchester, died last week. (Page 309.)

Serious strikes in the American building trade are threatened. A demand of 2s. more per day is made by the men. (Page 314.)

Barge-boards. ONE of the little delights that the architect and builder in the suburbs and provincial towns indulges in is the sham barge-board. These seekers after the quaint and the picturesque in domestic architecture are, however, only conforming to the general spirit which seemed to possess architectural students of the last century, namely, the sketching fervour. Students go all over the country sketching nice little bits that they think will come in very handy for incorporation in their after-practice. They little understand the reasons why these forms came into being, neither when they exemplify general principles or are the outcome of peculiar local conditions or circumstances not likely to recur in any other problem. The barge-board as now used is more often than not nailed on to the wall, and we have even seen architects go so far as to model it in cement plastering and paint it, which is only equalled by the instance of an old theatre at Islington where sham half-timber work is painted on a plaster surface. The barge-board had formerly a particular constructive use. It was not employed without reason nor used simply as a fanciful decorative detail. Its use was to take the place of a barge-couple, or to protect the rafter of the same. The barge-couple is the name for a rafter which carries the portion of the gable roof projecting beyond the gable wall. The barge-couple must be carried by something, and support is usually given by running the horizontal timbers of the roof over the gable wall, namely, the plates, ridge pole and purlins, although occasionally one finds barge-couples as separate timbers supported underneath by brackets. These rafters are occasionally moulded and ornamented, but generally they are covered by barge-boards which prevent the rain driving in, though this protection has often been rendered futile by the piercing of the boards in the fanciful manner of the Elizabethan period. The barge-board is essentially appropriate to a half-timber building, because in such a system of construction it is impossible to have resort to a coping to protect the top of the wall. The overhanging roof serves this function, and of course it can be used similarly to serve as a coping in brick and stone construction by being run over gable walls and over eaves; but if this is done it certainly needs to be carried over a good way, and this does not seem so sensible or harmonious a way to protect the walls of a building from the penetration of rain where a block of two or three houses is built and the by-laws require the party-walls to rise above the roof for purposes of preventing the

spread of fire. The indiscriminate use of barge-boards is simply absurd. It is, if anything, worse than with battlements. We are getting to be more reasonable in the planning of buildings, and do not seek to gain picturesqueness at the expense of convenience in arrangement, but we need to effect some reform in the decorative architectural detail of modern architectural practice, which is too often the result of cribbing without understanding.

A Voice from Italy. READERS will doubtless recollect that some weeks ago we gave particulars

of the huge national memorial to Victor Emmanuel which is being erected on the Capitoline Hill at Rome. "An Englishwoman in Italy" writes to the "Morning Post" and raises some questions of considerable interest—questions which have an application quite outside this particular subject. The English, she says, are inclined to regard Italy "as a subject State whose *raison d'être* is to enable them to bask in the sunshine, revel in cheap pensions, and wear their old clothes," and critics talk about Italy and her monuments in a way which, it is suggested, is quite too patronising. This Englishwoman in Italy observes that "the Italians probably have their own opinions upon the pagoda erected to the Prince Consort, also on the failure of any suitable memorial to the first Empress of India; but they do not express it. . . . Modern Italy is full of life: to her belongs the future, her industries are flourishing and will soon free her from the yoke of the foreigner; her finances are on a sound basis; so why are modern Italians expected to hustle out of Rome the monument which is the immortal consecration of the King who represents to them the new order of things, in order to spare for archæologists a few interesting but unimportant landmarks?" We do not doubt the justice of these remarks; but so far as the cost of the memorial goes, if we in this rich country have had to cut down the scheme of the memorial to our late great Queen because sufficient funds are not forthcoming, it seems rather disproportionate for a country like Italy, which (however hopeful its future may be) is certainly not a rich country at the present moment, to indulge in a memorial like that to Victor Emmanuel, the cost of which down to the end of last year was about £750,000, the monument being then still far from completion. We note that three Italian architects are to carry on the work of the late Count Sacconi (see page 317 of this issue), and that some disapproval of the choice is expressed.

SKYSCRAPERS.

WITHIN the last week or two there has been a revived interest in the skyscraper, and some speculation has been made as to the likelihood of its appearance in London. Mr. Denell's paper before the Institute also directed attention to the subject. It is opportune, therefore, to give some practical details as to the design and building of the skyscraper.

Methods of Construction.

The methods of construction available may be classed under three heads—masonry construction, skeleton steel construction, and reinforced concrete construction. Masonry construction, depending on solid walls, is practicable to a certain limit only—the limit being usually about ten or twelve storeys—for the reason that beyond that height too much valuable space would necessarily be sacrificed to walls. According to a table prepared by Mr. F. E. Kidder, the city ordinance requirement for a twelve-storey building in New York is 40ins. thickness for the first storey exterior wall. The building law of Boston requires 36ins. for the same wall; St. Louis, 34ins.; Denver, 30ins.; while Chicago is satisfied with 28ins. On the basis of the New York requirements, a

building 300ft. high would require a wall 7ft. thick, so that masonry construction may be dismissed from the skyscraper problem.

The first advance from masonry construction was the use of cast-iron columns, which were protected with fireproof coverings. But since the possibilities of steel construction became known very little use has been made of cast-iron for columns. One reason for its disuse is the difficulty of making satisfactory tests of its strength, owing to the possibility of the shifting of the core in casting. When steel columns were first used in high buildings they were merely to support the floor loads, as in the "World" building in New York, which is 199ft. to the roof line, with self-sustaining brick walls faced with sandstone and terra-cotta, the thickness of the wall being 11ft. 4ins. at the bottom and 2ft. at the top. The steel columns were let into chases in the wall in the lower storeys and set free above.

The Skeleton Steel Frame.

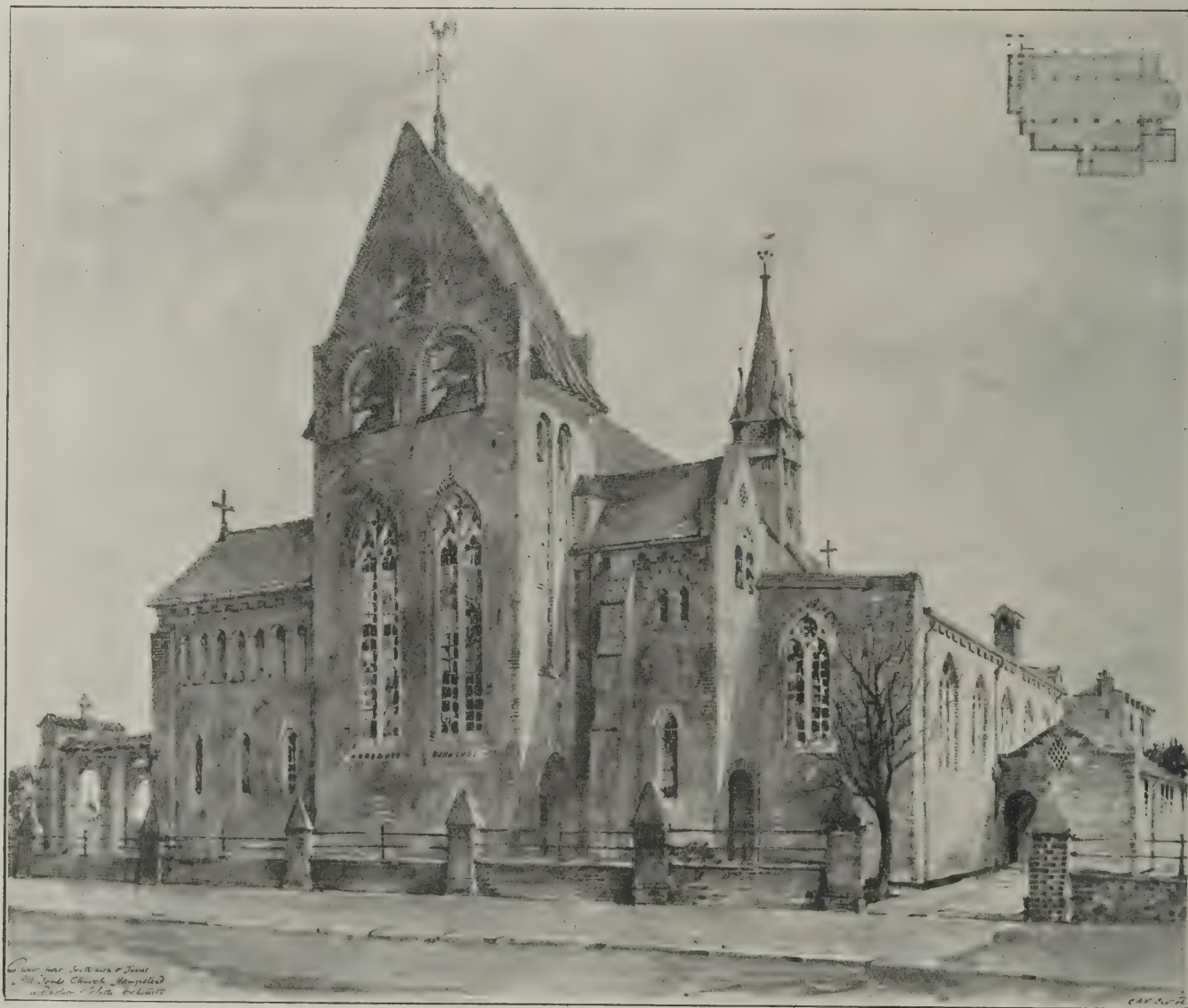
The next step in high building construction was the skeleton steel frame, in which all floor and wall loads are transmitted directly to the columns and by them to the foundations. The girders of each floor are calculated to carry the floor load and exterior curtain-wall for that storey, thus eliminating

the necessity of exterior walls except for protection from the weather. The thickness of these walls varies. The Chicago building law requires that the curtain-wall of a building 250ft. high shall be 12ins. thick for the first 150ft. from the top, 16ins. for the next 50ft., and 20ins. for the lower 50ft.

The most essential part of the construction of a skeleton steel frame is the actual support or column. Other parts of the structure may be weak without causing more than local damage, but when a column fails the entire structure is liable to fall; hence the greatest care of architect and engineer must be used in calculating stresses and in framing columns and their connections.

Reinforced Concrete.

The first skyscraper to be built on this the third method of construction was the Ingalls building of Cincinnati, O., begun in 1902. For the reinforcement cold-twisted square bars were used throughout. This system greatly increases the tensile strength of the bars after twisting and increases the mechanical grip of the bar on the concrete. The Ingalls building is 50ft. by 100ft. on plan, sixteen storeys high, 210ft. above the pavement and 20ft. below to the bottom of the foundations, which are also of reinforced concrete. The exterior walls are faced with marble



ADDITIONS TO ALL SOULS CHURCH, HAMPSTEAD. NICHOLSON AND CORLETTE, ARCHITECTS.

This work was commenced in 1904 and has recently been completed. The church consisted of a nave and apsidal chancel with a north aisle and bell-cot. A south aisle has been added, and the singularly ugly west front masked with a new tower forming a baptistery and belfry. The old bell-turret has been remodelled and the entrances have been rearranged. The old roof has been ceiled and re-slatted, the north aisle covered with copper, a new font has been placed in the church, and a new reredos is in hand. The materials used are stock bricks and Portmadoc slates, the south aisle being leaded and the saddleback tower covered with red pantiles. The peculiar plan of the west end was necessitated by conditions of frontage. The architects were Messrs. Nicholson & Corlette, of London, and the builders Messrs. Leaney & Co., of Southend. The drawing reproduced above was exhibited at this year's Academy.



This house was designed by Mr. John Cocker, architect, of Altrincham, merely as a stock example, to be built with a red Runcorn stone base, local common bricks, rough-cast, and flag roof.

for the first three storeys, glazed grey brick for the next eleven, and glazed white terracotta for the last storey and cornice.

That steel encased in concrete is perfectly preserved from rust is well known, and if more proof of this were needed it could not be better supplied than by the demolition of the Plaza Hotel in New York within the past month or so. This hotel was built about 1879. The steelwork disclosed was found to be in excellent condition everywhere—even the floor-beams of the kitchen and laundry, where there was much chance of moisture reaching them, being quite unaffected by rust. This fact is all the more noteworthy when it is stated that the framework had not been protected by paint or any other preservative.

Foundations.

In New York City when it is necessary to go to great depths for foundations the pneumatic process is successfully employed. In Chicago a system of grillage, on piles, of I-beams and concrete has been in use for several years. And now that reinforced concrete piles are available, and do not have to be cut off at the water-line to prevent decay, we have a fireproof, windproof and practically indestructible building as the result.

In view of the possibility of conflagrations liable at any moment to temporarily jeopardize the business interests of every city, it is considered that the requirements in regard

to materials and construction of buildings in such districts should be most rigid and comprehensive in every detail.

Can Skyscrapers be made to Look Satisfactory?

With reference to the aesthetics of the skyscraper, we may quote from a paper read by Mr. Edward S. Hammatt, architect, before an American society recently. We must remember, he says, that our aesthetic training is based on the proportions of Classic architecture—the low buildings of the Grecian archipelago. We are appalled at the seeming hopelessness of reconstructing our aesthetic ideas on such a gigantic vertical plane as a skyscraper demands. It may be said that architects have had a vertical problem to deal with before, in the Gothic cathedral. That is true, but the conditions are entirely dissimilar, for there was a proportionate breadth at the architect's disposal. Many of the skyscrapers are on plots so narrow in comparison with their height that little remains to be dealt with but a vertical streak, as in the acute angle of the "Flatiron" or Fuller building of New York. Attempts have been made to reduce the apparent height of these buildings by the use of repeated horizontal lines. The result of such treatment is seen in pronounced form in the St. Paul building in New York. Here the designer has grouped two storeys together and piled section on section in monotonous uniformity, until the client's

money-limit was nearly reached, when, as a sublime effort, three storeys are grouped above a sub-cornice and the attempt is finished—a procedure, as one writer puts it, "quite as sensible as if a man were to thrust his head through the crown of his hat and wear it below his head instead of above it."

Various other styles of high office buildings are seen, but few are satisfactory in appearance. The fact is, the problem is really an impossible one with more than a certain number of storeys. There have been, however, some notably successful attempts to secure a satisfactory design, chief among which are the Monadnock building in Chicago, designed by Mr. John W. Root; the Schiller building in Chicago, designed by Mr. Louis H. Sullivan; and the preliminary sketch for the "New York Times" building, by Mr. Cyrus L. W. Eidlitz.

Whether or not the skyscraper will eventually make its appearance in London is a moot point; probably it will not; certainly not to the height of some of the erections in New York; but, to our mind, there can be no doubt that steel framework for buildings will be more and more adopted. We may not like it, but it will be used all the same, for the reason that it enables buildings to be erected so much more quickly; and in the future the proverb that "Time is money" will have a more poignant application even than it has to-day.

Views and Reviews.

A Mechanical Year Book and Diary.

The nineteenth annual issue of this useful little pocket diary has just been published. It is now a well-established favourite with engineers, and provides a large amount of most useful information. It deals with all branches of the subject and even includes useful data on beams and girders and other details that concern structural engineers, architects and others connected with the building industry. In this issue a considerable amount of new matter has been introduced. The steam turbine is dealt with very lucidly in a section of ten pages, written by Mr. R. M. Neilson, a well-known authority. Another section has been included on refrigerating machinery, ice manufacture and cold storage, while a third section deals with speeds and feeds suitable for high-speed steel tools, in which connection a new and extended table of cutting speeds is given. Additions have been made to the section dealing with gas and oil engines, and among other new matter will be found tables of screw threads, strength of crane chains, shaft bearings, weight of bolt heads, and useful recipes.

"The 'Mechanical World' Pocket Diary and Year Book for 1906." Manchester: Emmot & Co., Ltd., "Mechanical World" Offices. London: 118, Chancery Lane, W.C., price 6d. nett.

Steel Arch Bridges.

The subject of bridge design and construction is a very important one, and one in which architects are interested: of course their interest lies more with stone bridges, but we think they have equally a right to deal with the design of steel bridges. It is true at the present time that there are very few architects who are capable of designing a steel bridge or intimately co-operating with an engineer in the design. Indeed there are few that could be trusted to put the trimmings on to an engineer's design—the only direction in which they have up to the present been permitted to have a say. In a few instances on the Continent and in the United States architects have only been called in to design the detail; and in this country the only instance we can call to mind is the new Vauxhall Bridge. Yet engineers are by the very nature of their training incompetent to design a steel bridge with any regard to beauty. We say this not meaning the added decorative detail, but using the word as the effect springing from structural fitness or logical treatment. Engineers engaged on this class of structure are, with few exceptions, wanting in originality and artistic training. The method by which they arrive at any particular design is to add the well-worn elements one by one until the needs are eventually fitted. They are seldom able to eliminate all but the essentials, and thus the detail is a conglomerate of solutions of various small problems. It is only after a considerable practice, and as a result of wide co-operation in the engineering trade, that methods are simplified. The architect's eye, on the other hand, instinctively grasps that the eventual solution arrived at is not a final one because of the inartistic or illogical appearance it has. It is the little details which an engineer is accustomed to accept as inevitable that ruin the effect of any skin of architectural detail that may be applied. Of course in the majority of cases the detail must be of the simplest kind, otherwise the work that each structural member is performing will be obscured, and the added weight will appear at once as a foolish waste of labour and give an intelligent observer a feeling of dislike—that is to say, it will appear ugly.

This book deals more particularly with practice in America, where the designers have progressed very rapidly, having had many

large jobs to undertake. It is well known how the American steel industry has co-operated in design and manufacture, so that in a short time considerable progress has been made towards standardizing steelwork design. This standardization means a final solution of certain problems in practice, and it is the want of this which has rendered the majority of engineering structures (after all the whole of steel design is only of about a century's growth) unsatisfactory from the point of view of architectonic beauty. When there is plenty of work, of course, it does not take long to evolve a logical treatment which shall give satisfaction, because it is experience which is the first essential.

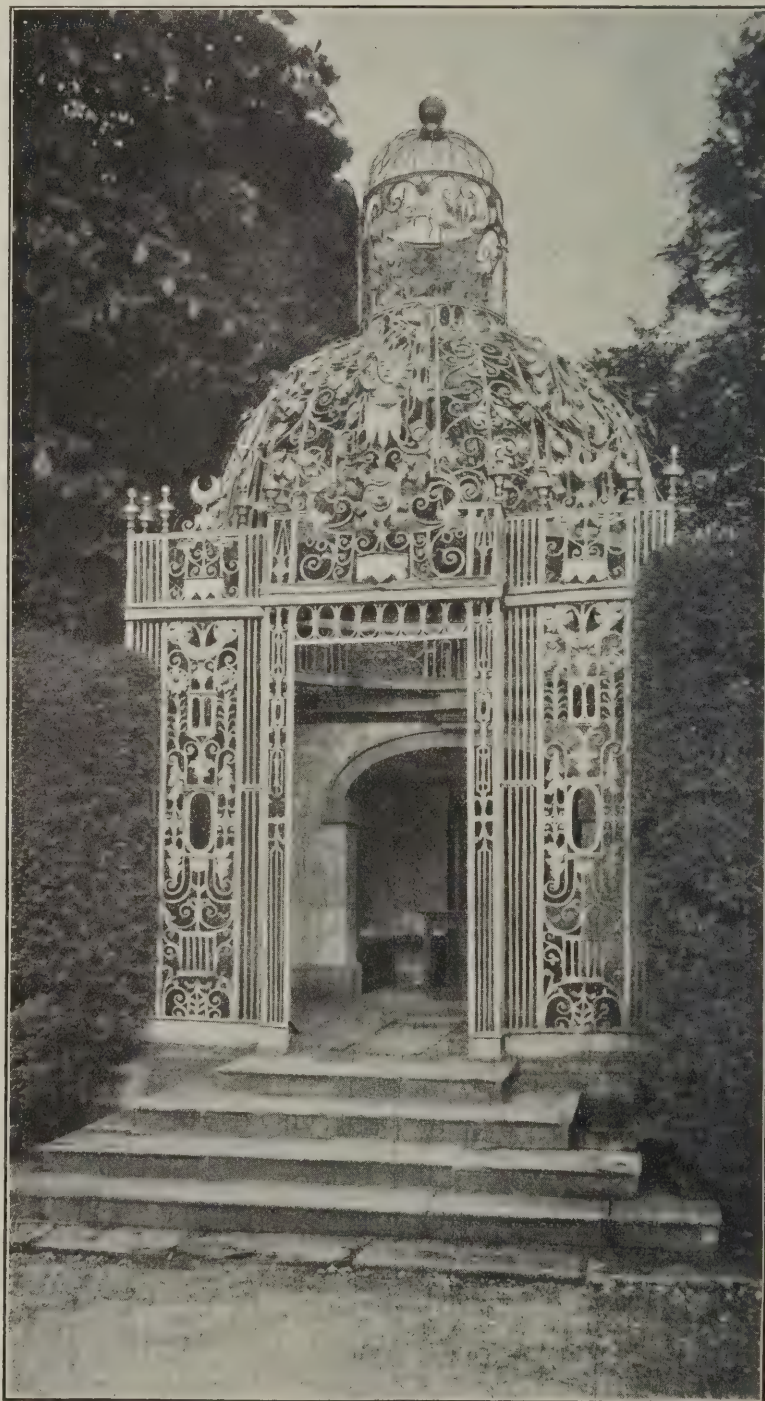
This book is of a very practical nature, and gives details of the most important members of many structures of several types of design in the arch-span bridge, together

with photographs of the completed works. These are very valuable, and should be studied by English architects and English engineers as representing the outcome of much experience. Many of these designs, which are not all American, including a few German and French examples, we think will appeal to everyone who has a slight knowledge of steelwork design as being extremely well fitted to their purpose and having a beauty all their own. Detail would have to be very carefully applied without destroying their beauty, gaunt and naked though it is.

"Details of Bridge Construction," Part I., by Frank W. Skinner, M.Am.S.C.E. New York: McGraw Publishing Co. London: E. & F. N. Spon, Ltd., 125, Strand, W.C., price 12s. 6d. nett.

The Standard Work on Plastering.

We have already dealt with this book in reviewing the first and second editions.



WROUGHT-IRON GARDEN HOUSE AT MELBOURNE HALL, DERBYSHIRE.

This delightful wrought-iron garden house is at the edge of the pool at the bottom of the stately terraced gardens of Melbourne. The little urns and crescents and the small repoussé arabesque mask are gilt. The vertical panels are somewhat distorted by a settling of the stone steps. The work probably dates from the middle of the seventeenth century.

The third edition is now before us. Our readers will recollect that the author, William Millar, died at the beginning of last year when engaged upon the revision of his book for the third edition. All the corrections and additions of which he left any notes have been made in the present issue, while the chapters relating to materials, including fibrous plaster, terra-cotta and concrete have been subjected to careful revision by another hand. Numerous minor alterations and additions have been made in some of the chapters and various diagrams redrawn, but the portions of the book dealing with the history have not been altered, nor the author's excellent descriptions of the practices connected with the crafts, for which the book is especially valuable.

The subject of plastering has many sides to it. There is much matter in the book relating to the artistic side and the history of plastering, and the book is all that can be required in this particular. We have heard a good deal of late from architectural draughtsmen and others who have taken up the craft, while amateurs have certainly improved its artistic treatment, but they have rather overdone the "art and crafty" part of it, and in regard to the practical treatment they have not helped us forward from where the ordinary operative plasterer left us. Mr. Millar's book gives all the practical information that is so valuable, and we could only wish that other crafts connected with the building trade had been as well dealt with. Of course the difficulty is to find a practical man who has the ability to write on the principles intelligibly. The author was a little too enthusiastic in regard to his subject and went outside his province in many respects by elaborating in regard to concrete work. There is plastering done with Portland cement or hydraulic limes, but this is as far as he should have gone. Long descriptions of the manufacture of Portland cement and the use for concrete work is out of place, because it does not concern the plasterer. Therefore we do not welcome the description of reinforced concrete which has been added to the volume, nor the revision of the matter relating to Portland cement. Reinforced concrete is altogether too intricate a subject for the plasterer to deal with. It requires considerable scientific ability, and the treatment in this volume is totally inadequate; in fact, it is almost ludicrous. Some of the writers who have assisted in the revision of the sections of the book dealing with concrete floors and staircases are too closely connected with trade to be recognized as unbiased authorities, and we do not see the taste of including certain forms of construction or specialities with which they are connected and excluding at the same time other specialities with which they are in trade rivalry.

"Plastering, Plain and Decorative," by William Millar. 3rd edition. London: B. T. Batsford, 94, High Holborn, price 18s. nett.

Chains for Hauling and Lifting.

We do not know of any book having been written on chains for hauling and lifting, and this paper is probably the first on the subject. When the Home Office recently prepared a series of draft regulations for docks and wharves much opposition was aroused, and Prof. Henry Adams was called in to give the authorities the benefit of his long practical experience in connection with dock machinery and cranes, with the result that the regulations finally issued were considerably modified and the dock owners relieved from what would have been onerous restrictions upon the carrying out of their work, particularly as regarded the testing of their chains and machinery.

"The Use and Care of Chains for Lifting and Hauling." A paper read before the Civil and Mechanical Engineers' Society by Prof. Henry Adams, M.I.C.E., M.I.M.E. London: Prof. Henry Adams, 60, Queen Victoria Street, price 1s.

Obituary.

Mr. Humphrey Hussey, builder, of Southampton, died recently, aged 65.

Mr. George Wiltshire, a retired builder of Earl's Court, was found dead in bed recently. He was 79 years of age.

Mr. R. B. M. Stewart, of the firm of Messrs. Potier, Stewart & Hardie, building specialists, Glasgow, was seized with illness while in his office on Wednesday last and expired almost immediately.

Mr. John Bowden, architect and surveyor, of Manchester, died on November 16th. He was known chiefly as a surveyor, and in this capacity was largely responsible for the Manchester Jubilee Exhibition of 1887. One of his latest buildings is the warehouse of Messrs. Cooper in Dale Street, Manchester.

Mr. A. W. Mills, architect, of Manchester, died on Wednesday last. He was born in London in 1829, and was articled to Mr. J. B. Bunning, with whom later he was joined in business at Manchester. In 1853, after Mr. Bunning's retirement, Mr. Mills took into partnership Mr. James Murgatroyd. When in July, 1838, designs were invited for proposed additions to the Exchange Room, the first premium was awarded to Mr. Mills, who thus became the architect to the Manchester Exchange, a position which he held till his retirement from active work in his profession in 1882. A further extension of the building was found to be necessary in 1845, and of this work Mr. Mills was also the architect. The building was completed in 1848. In 1866 an Act of Parliament was obtained for the building of a new Royal Exchange, and fifty-three designs were submitted. The two sets which secured the approval of the majority of the directors were found to be those prepared by Mr. A. W. Mills and his partner, the late Mr. Murgatroyd; and they were awarded the first premium of 500 guineas and the second of 200 guineas. The building was opened in two portions—the first in October, 1871, and the second three years later. In addition to the Royal Exchange, Mr. Mills was the architect of the London Road Station, Collier's warehouse in Aytoun Street (since transformed into the Grand Hotel); the Manchester workhouses in New Bridge Street and at Crumpsall, the enlarged grammar school (with its very complete gymnasium), the High School for Girls in Dover Street, Oxford Road, and the headquarters of the Manchester and County Bank, with several of its branches in surrounding towns. Mr. Mills was one of the founders of the Manchester Society of Architects, and was its third president from 1869 to 1871. He was elected an F.R.I.B.A. in 1877.

"An Old Scottish Town."—This was the title of the paper which Mr. James A. Morris, architect, Ayr, read before the Edinburgh Architectural Association last week. After outlining the history of Ayr, he gave particulars of the prominent architectural features of the old town, including the Old Bridge, Adam's Bridge, the Tolbooth, the Old Church, the Wallace Tower, the Church of St. John, and the Citadel. In the course of his remarks regarding the Old Bridge Mr. Morris referred to the question of its preservation. He joined issue with the opinion of Sir William Arrol and Mr. Hall Blyth, who advocated the destruction of the Old Bridge and its rebuilding as far as possible with the old material. Mr. Hall Blyth seemed to think that the identity of the bridge would thereby be preserved, forgetting that if once destroyed the Old Bridge and the bridge of Robert Burns was gone absolutely and irretrievably. Mr. Morris indicated that he approved of the schemes submitted by engineers advocating the preservation of the existing structure.

Competitions.

Luton Secondary School and Technical Institute.—The following ten architects have been selected to compete in this competition:—Messrs. Russell & Cooper (London), Mallows & Grocock (Bedford), Gotch & Saunders (Kettering), Greenaway & Newberry (Westminster), Spalding & Spalding (London), A. Hessel Tiltman (London), Brown & Sons (Luton), Milne & Milne (Bedford), M. Zimmermann (London) and Deacon & Hind (Liverpool).

Perth City Hall.—At a meeting of the Perth Town Council in committee last Wednesday the assessor's awards in the competition for a new or reconstructed City Hall were submitted. There were altogether thirty competitors, and three plans were selected in order of merit for a new hall for premiums of 50, 30 and 20 guineas. There were also three plans selected for reconstruction, the premiums for which were 30, 20 and 10 guineas. The first premium for the erection of a new hall was awarded to Mr. J. Wallace Archér, of Edinburgh; the second to Messrs. Thomson & Robertson, of Brighton; and the third to Messrs. Henry & McLennan, of Edinburgh. The first premium for reconstruction was awarded to Mr. James Sibbald, of Dundee; the second to Messrs. Menart & Jarvie, of Perth; and the third to Messrs. Hall Jones & Cummings, of London. A letter was read from the assessor (Mr. John J. Burnet) in which he practically advised the council to adopt the reconstruction scheme. The designs will be on public exhibition for a fortnight in the Sandeman Library.

MODERN ARCHITECTURE IN SWEDEN.

IN Sweden to-day there is a group of well-educated, far-travelled, brilliant young architects, says a writer in the "American Architect." No country gives its people a better education. When a young man training for architecture has finished his college course, he spends four years in the technical high school under the careful and thorough instruction of Professor Clason, himself a master of design, an art critic and historian. Only about one-half of the applicants are admitted, the examination being competitive. After finishing this course the best students spend three years in the Academy of Fine Arts, devoting themselves entirely to design. In the last year there is a competition for the Royal Medal, which entitles the holder to three years' foreign travel. It seems that, medallists or not, most of the young men manage to spend a year or two in southern Europe, and several have supplemented their home training with some years in American offices. The average number of students in the Academy is only fourteen or fifteen, because the many competitions and examinations have weeded out the weaklings.

The Three Schools.

There are readily noticed three tendencies among the modern architects. First, there is the "eclectic" school, foremost among whom are Clason, Aronson, Johanson and Josephson. These men go where they think the suggestions for the problem in hand are the best—one day Italy, next the Isle de France or England, or maybe Spain.

The "national" school, on the other hand, contends that the only way is to continue the tradition of their own country reverently and intelligently. Hagstrom, Eiljekvist, Wahlman and Lindegren have done good work based on suggestions from the past. Among the motives that have appealed to these men are the strong and bold roof-lines, often gracefully curved and freely broken up with towers and turrets, dormers and chimneys. A characteristic treatment of the roof



THE "TOM TOWER," CHRISTCHURCH COLLEGE, OXFORD. DRAWN BY C. T. ARMSTRONG.

This tower derives its name from "Great Tom," the bell in its upper stage, formerly belonging to Osney Abbey. The entrance gateway was erected to the height of the two smaller towers by Cardinal Wolsey, but the bell tower was added by Wren about 1632.

is seen in the break at about half height, with a foot or two vertical, and often pierced with windows. This motive is an echo of the clearstory. Another suggestion is found in brick walls where a pattern or sunk-panel work has the background plastered to bring out the design. They call this "Baltic." For the interior there are endless suggestions in the ceilings, both panelled and plastered, the wainscoting and doorways of the early Renaissance.

The third group is that of the "individualistics," and it probably includes the most resourceful of the designers, even if some of their work is so new that the shock when first seen is difficult to get over. If they always did as good work as Boberg, Wickman and Lallerstedt, one would have little fault to find.

New Cities and House Design.

Not only the architects, but, what is more to the point, the city fathers, have begun to realize that there are two ways of planning a city, one using the engineer's checker-board, and one where the natural conditions of valleys, hills, rivers, railroads, existing buildings, old roadways and other circumstances influence the final appearance. Several new cities have been planned *de novo* by the architect Hallman, and at least two cities, Gothenburg and Helsingborg, have instituted competitions for the best scheme for future extension of their limits.

The newer villa architecture is quite notable. Somehow the Swedes have learned—even the carpenter-builders know how—to place suburban, seaside or mountain residences so as to nestle down snugly among the surroundings. The original clump of pines, firs or birches is preserved as much as

possible, and just enough of the house, with its flag-pole, is seen as to excite the curiosity of outsiders, and yet give the dwellers a view to the outer world.

Scholander.

It is quite impossible to ignore the name of F. W. Scholander. He was really the founder of the present movement for better things in architecture. By nature a poet, and by nature and training an architect and painter and a man of strong personality, it was inevitable that his influence as professor of architecture for a generation should be great. Nearly all of the older architects were guided in their early years by him.

A worthy successor was found in Professor Clason. A man of great energy, a designer of rare taste, highly eclectic and refined, and often original, he stands easily a leader in the profession. Time and again he is called in as an assessor in competitions, while as a forceful, elegant and epigrammatic writer and historian he stands in every way for that which is best and highest in his profession.

Stone and Brick now used in place of Stucco.

There was a time when the use of real brick and stone for the face of a building

was unknown in Sweden. It was the era of the pseudo-classic, when nothing would "go" except the "orders" and an accompanying cut-and-dried system of details, invariably executed in stucco. A few years ago, however, Professor Clason, then quite young, made a bold effort to break away, and introduced real stone in some apartment-houses. It is worth noting that he found, when looking for suitable material, just one quarry in a country with limitless supplies of the finest kind of granite, sandstone and limestone. To-day all that has changed and new buildings of any note, at least public structures, are always of native stone or brick.

Curiously enough, stucco has really lost nothing. In place of being used for senseless imitations of Italian forms, this material has now come to its own, when handled by masters of design. They use it in broad masses, sometimes coloured as a background to set off the grouped windows. Recognising its plastic qualities, they concentrate their ornament and use flowing forms that are in harmony with the natural manner of working in this material. Sgraffito is also used, notably in friezes, where good effects are obtained by scratching patterns through a light top-coat to a dark coat beneath.

Regulations.

Although there is no licensing of architects, building is very thorough. A general law obtains throughout the whole country. Local conditions are provided for by supplementary regulations enacted by each city. As an instance of the strictness of the laws, it may be noted that no wooden stairways are permitted inside city limits. Stairs are usually of stone or concrete, and are carried by brick walls; and there is no skimping in the use of brick walls, as they are considered the best of fire-retardants.

As labour is cheap, machine-made stuff is rare—in fact, standard designs of pews, pulpits, mantels, &c., are nearly unknown. The result is that architects can afford, even in quite ordinary work, to indulge in "special design."



IFFLEY CHURCH, OXON., FROM THE SOUTH-EAST.
DRAWN BY C. T. ARMSTRONG.



HOUSE AT CROYDON. WILLIAM F. HARBER, ARCHITECT.

This house has been built of stock bricks, rendered externally with cement rough-cast and pebble-dashed—mixed before application with copperas to dry a light biscuit tint. Portions of the interior are panelled in pine painted a light stone colour. The architect was Mr. W. F. Harber, of Chelsea. The drawing reproduced above was exhibited at the Academy this year.

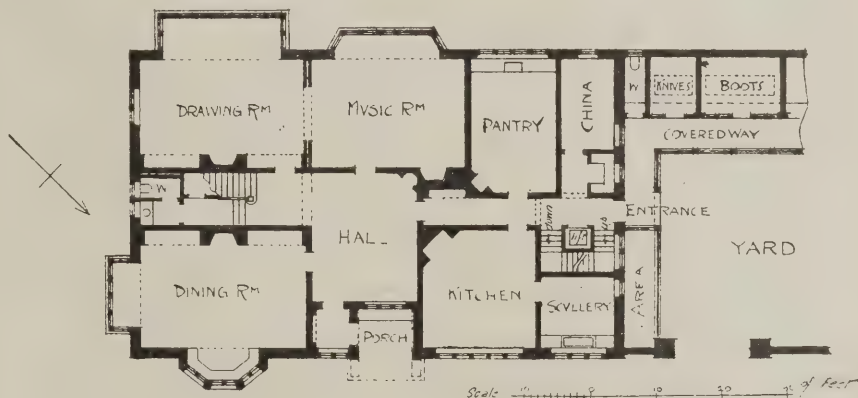
Correspondence.

Foreign Fireproof Floors.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Your correspondent "A. C. F.," in upholding the prerogative of architects to specify whatever goods they please, whether foreign or British, has fallen into several errors, doubtless from not having clearly understood the purport of the comments made in many of the letters which have lately appeared in numerous organs of the press. So far as I have gathered from reading the correspondence referred to, the complaint has been that foreign-made goods, to the exclusion of British-made goods, have been and are now being specified by the "Barrack Construction Branch" of the War Department and by the architects of buildings being erected on Crown lands, &c., regardless of the facts (as alleged) that numerous firms in London alone produce goods of equal or better quality at lower prices. These allegations are not mine, but, so far as I have yet seen, nobody has traversed them. Certainly "A. C. F." makes no attempt to do so. His championship of architects is a mixture of boldness and feebleness, if I may be permitted to say so without offence. The boldness is in his claim that architects and their specifications are above and beyond the criticism of the lower mortals. His feebleness is in the unconscious drollery of his plea that the Italian-made partitions are "fixed by English labourers." I wonder he did not add that the mortar or cement used by these few highly privileged Englishmen is actually mixed with English water!

So far as I understand the recent correspondence, the questions to be answered by "A. C. F." and those who take up a similar position are—(1) Is an architect justified under existing conditions in specifying foreign-made goods, which are admittedly dearer and not proved to be better than kindred articles made by numerous firms in this country? (2) Is it correct for an architect to specify a certain foreign-made article by name, without adding the customary



words "or other approved make," thus making it compulsory on the contractors to obey, when such architect has closed his eyes and ears to the British makers of kindred articles who would have been only too grateful to be even permitted to quote?

I may say that I am not one of those imaginary "British working men" whom "A. C. F." erroneously supposes to have been criticizing his profession. As a matter of fact, I have not observed that a single individual of the working class has intervened so far in this correspondence. For my part I look at the matter as a taxpayer and ratepayer. As a taxpayer I object to public moneys being spent abroad; and as a ratepayer I demur to the still further increase of rates, which must inevitably accrue from Government departments, for unexplained reasons, persisting in increasing the number of our unemployed at home by placing their orders in foreign countries.—Yours truly,
OBSERVER.

Office Towers.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Your leader on "Office Towers" has excited greater interest than possibly even you surmise. The ideal site for a first attempt is now open, namely, between the Hotel Cecil

and Villiers Street, facing the public gardens and the Embankment—a most central position and now for sale—where the office tower would not overshadow other property to any extent, and if artistically erected (say, after the style of St. Mark's Campanile, Venice) could hardly meet with the opposition of the L.C.C.—Yours truly,
A READER.

Mr. Dawber's "At Home."

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Allow me a space in your journal to call the attention of readers who are members of the Architectural Association to the "At Home" which I am giving on the evening of December 8th, at 8.30, at No. 18, Tufton Street, Westminster. I am very desirous of welcoming as many members as possible who may not perhaps have seen our new premises, and who would like to take this opportunity of meeting old friends and students and members of to-day. There will be an exhibition of holiday sketches and photographs, &c., and I hope the evening may result in the furtherance of that spirit of good-fellowship which it has always been the aim of the Architectural Association to foster.—Yours truly,
E. GUY DAWBER, President.

Law Cases.

New Houses : Occupancy before Certificate for Drains and Water granted.—At the Bristol Police Court recently a local builder was summoned for allowing three new houses to be occupied before the drainage was completed, and also for allowing the houses to be occupied before being certified to be in every respect conformable to the by-laws. The bench imposed a fine of 10s. and costs in respect of each house.—Mr. A. H. Clough, of Ringwood, was recently summoned by the Salisbury Rural District Council, for permitting a certain dwelling-house built by him at West Winterslow to be inhabited without first having obtained from the local authority a certificate that there was within a reasonable distance an available supply of wholesome water. Mr. Clough pleaded not guilty, and stated that he applied for a certificate and failed to get it in four months. Mr. Trethowan, for the council, said it was quite true that the defendant did apply for a certificate, but he applied when there was really no water-supply. Mr. D. W. Morrice, inspector of nuisances to the council, said that the house was occupied on September 20th, whereas there was no certificate granted until October 27th. Mr. Clough in the course of his defence said he arranged to supply the cottage from a well 130 yds. distant, and he asked the council to sanction this proposal pending his being able to carry out a scheme which he had in contemplation respecting other cottages at Winterslow. An ample supply of water was laid on by a pipe from the well. Between August 4th and September he laid on the pipe, and at the end of the latter month he received a letter from the council declaring that the pipe was not protected. He wrote replying that that was not a reasonable objection, and at the end of October they granted him the certificate. Mr. Trethowan said that he wished to point out that when Mr. Clough made his application for a water certificate there was absolutely no water-supply to the house at all. Then from time to time certain alterations were made. As soon as everything was put right the inspector came and asked the council to grant the certificate. There was no delay on their part at all. Mr. Clough persisted that there was delay, and added that he was still rather in the dark as to what constituted a reasonable distance in regard to this matter of water-supply. The magistrates fined him 10s. and costs 9s.

A Bradford Architect and his Pupil.—On November 20th at the Bradford County Court his Honour Judge Bompas, K.C., gave judgment in the case in which James Edgar Adamson, a minor, sued through his father, Mr. J. J. Adamson, architect, of Hull, to recover damages for breach of indenture of apprenticeship from Mr. H. E. Priestley, architect, of Bradford (see p. 271 of our issue for November 8th). The plaintiff had said that his son was not making satisfactory progress in the defendant's office. The defendant in reply had stated that the plaintiff was disobedient and did considerable damage to the office property, and defendant refused to take him back after he had left on one occasion to consult his father. His Honour, in giving judgment, said the action was brought under the articles of apprenticeship against the defendant for not instructing the plaintiff according to agreement. It had been held that if one made it impossible for the teacher to fulfil his contract one could not sue him for not doing so. The first question he had to decide was whether or not the conduct of the plaintiff was such as to make it impossible to teach him. He found this was not the case, but the plaintiff seemed to have been a very disagreeable pupil. Considering the question of damages,

he thought it reasonable that they should be a proportionate part of what was paid for the apprenticeship, and he fixed the amount at £18 7s. 6d. With regard to defendant's counter-claim of £50, it was clear that he could not allow a counter-claim against an infant for the breach of his contract to be a good apprentice. That was an action which lay, if at all, against his father. It was said that in certain circumstances an infant could be sued for tort. No doubt it was a tort if you took up a great piece of iron and hit it upon the floor to annoy your mistress, but it seemed the natural misconduct of a youth who was a somewhat lively apprentice and did not get on well with his master and mistress, and it was not such as would render an infant liable. He therefore declined to allow the counter-claim. His Honour went on to say that in making these remarks he did not wish to encourage the defendant to bring an action against the plaintiff's father. He knew there was a strong inclination when one failed in an action to bring an action against another person, but that was not a very Christian spirit. Moreover, he thought it was the class of case which, if the father were sued, would be very expensive, and there would be the risk of failure after all. Quarrels were not good things in this world, and he suggested to the defendant whether he had not better "grin and bear it." Mr. Harold Newell, who represented the defendant, said his Honour would remember that the plaintiff made certain suggestions as to the defendant's practice and consequent inability of the plaintiff to get instruction in the defendant's office. The defendant adduced a good deal of evidence to rebut this accusation, and might have given more but for the fact that his Honour expressed himself as perfectly satisfied that the defendant had a good, reputable and extensive practice. Unfortunately, that remark of his Honour's was not published, and he would like the judge to make some deliverance on the point, because the impression that had got abroad tended to do his client considerable harm. His Honour: "I formed the opinion that there was nothing in the defendant's practice that prevented his being thoroughly competent to teach an apprentice." On application by Mr. Newell, his Honour gave leave to appeal on condition that £30 was brought into court.

The Height of Kitchens.—At Oldbury last week a builder named Wills, of King's Heath, Birmingham, was fined 20s. and costs for providing kitchens only 8ft. 2ins. high, instead of 9ft. as required by the by-laws, in some houses which he was erecting in Park Road, Warley.

Light and Air Case.—On November 21st at the Plymouth County Court his Honour Judge Lush-Wilson gave judgment in an action brought by Mrs. Ellen Hamlyn, as owner of 15, King Street, Devonport, against Mr. E. M. Leest, architect, of Devonport, for damages caused by the erection of a wall 28ft. 2ins. high, which, it was alleged, had materially diminished the light and air to the house. In giving judgment, after a very lengthy hearing, his Honour said he was not going to find a verdict for the plaintiff in the matter of the air question, as he was satisfied that the air had not been materially diminished so as to cause inconvenience to the plaintiff. But with regard to the matter of light there was no doubt that the value of the plaintiff's premises had been materially affected by the erection of the wall, which must have obstructed some light, and there was no doubt that many persons who wanted light rooms to live in would not become tenants of the premises. There had also been a trespass on the plaintiff's premises with scaffolding used in the erection of the wall. Verdict for plaintiff for £80.

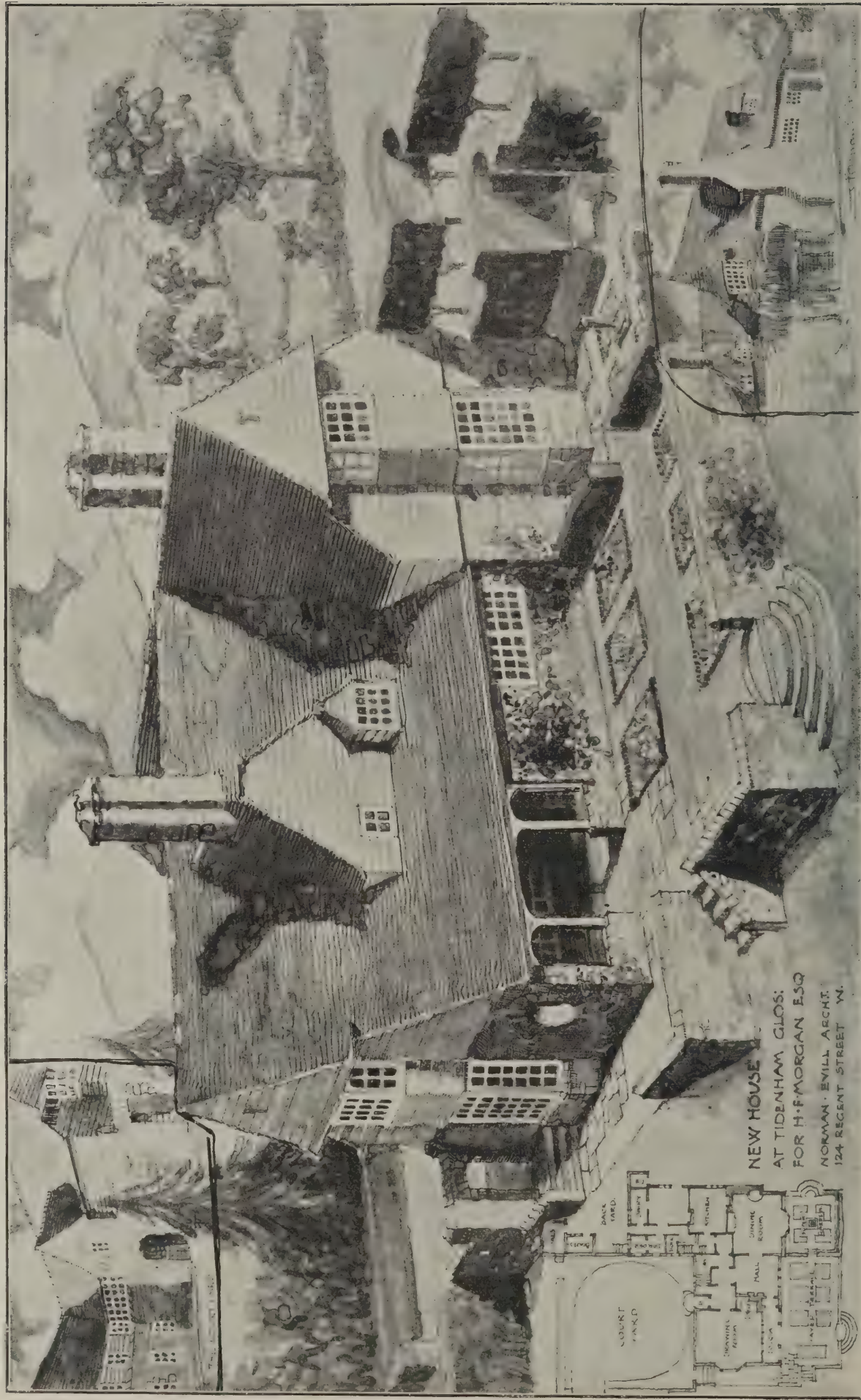
OUR PLATES.

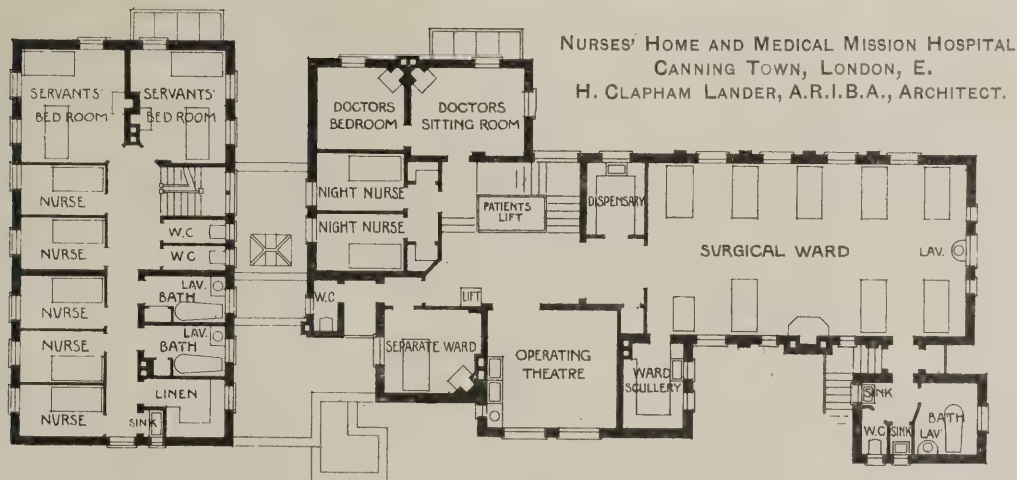
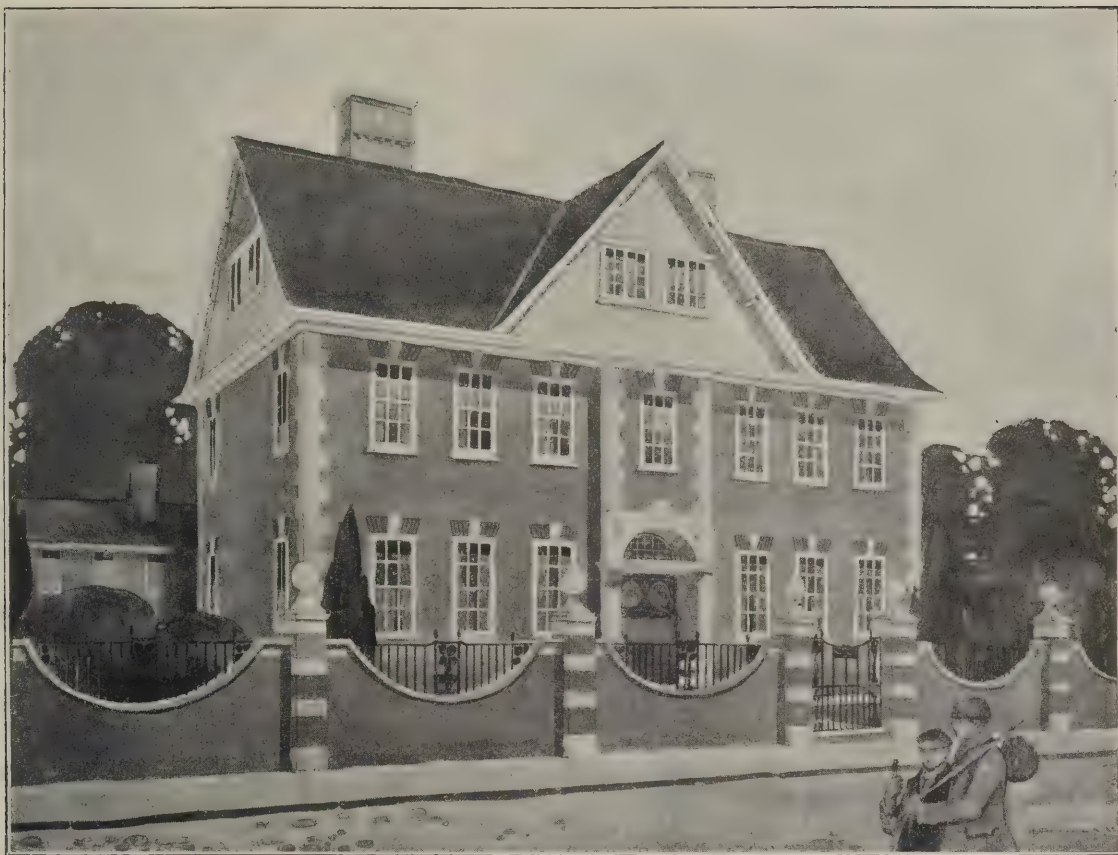
THE house at Tidenham, Gloucs, is built of local limestone, the upper part being weather-boarded with elm, which, when toned down by exposure, harmonizes so well with the silver-grey and delicate greens, yellows and pinks of the Gloucestershire stone. The site has a commanding view of the Bristol Channel, almost from Gloucester to the Somersetshire coast, with a view of the Wyndcliff overlooking Tintern Abbey behind. The approach is along a natural avenue of trees, from which the house was set out, terminating in a square courtyard with the house forming two sides and with a yew hedge on the other two sides. The house, with its long slope of roof, was designed to compose with and carry out the slope of the field in front. The terrace is paved with old paving stones, with box-edged beds and a small sunk garden in front of the dining-room. This latter is panelled, with an oak dresser designed on old-fashioned lines, let into a recess and kept flush. The architect of the house is Mr. Norman Evill, of 124, Regent Street, London, W. The drawing reproduced was exhibited at this year's Academy.

The medical mission hospital at Canning Town has been erected for the committee of the Settlement for Women Workers. It is built to accommodate women and children only, and is divisible into two parts, the hospital and the nurses' home. The former has been given by the generosity of Messrs. W. H. Brown and J. R. Roberts, both of Woodford, and the home has been built by subscription. The home is for nurses engaged upon district work as well as for those employed in the hospital. The outpatients' department is at Old Canning Town. There is no provision for such cases in this building, nor for accidents. The nurses' home faces Balaam Street, and the hospital is placed towards the rear of the site and near its northern boundary, so as to give space for a large garden on the south side. The accommodation in the nurses' block comprises nurses' dining- and sitting-rooms, home sisters' room, nurses' and servants' bedrooms, with bath and linen rooms, &c., as well as attics. Between the home and the hospital are the main kitchen and scullery, as these will be used in connection with both departments. The hospital block on the ground floor consists of a medical ward with eleven beds, sanitary annexe, ward scullery and verandah facing south, as well as rooms for matron and assistant doctor. On the first floor the hospital is detached from the home and contains a surgical ward with nine beds and sanitary accommodation and ward scullery (as on the floor below), a single-bed ward for patients needing quiet, an operating theatre, rooms for doctor and night nurses, and dispensary. At the rear of the site is a laundry block (not shown on the plan) consisting of washhouse, drying and ironing rooms, with rooms for caretaker over and a mortuary and post-mortem room. The foundation-stone was laid by Mrs. W. H. Brown on November 3rd, 1904, and the buildings were opened by the Countess of Aberdeen on October 19th last. The architect was Mr. H. Clapham Lander, A.R.I.B.A., of Effingham House, Arundel Street, W.C., and the general contractors were Messrs. Gregar & Son, of Stratford. The amount of the contract for the whole of the premises, including laundry block, was £7,788. The average cubic space allowed per bed is 1,123ft., and the cost of hospital (excluding home and laundry) per bed, £231. The perspective of the nurses' home was exhibited at this year's Academy.

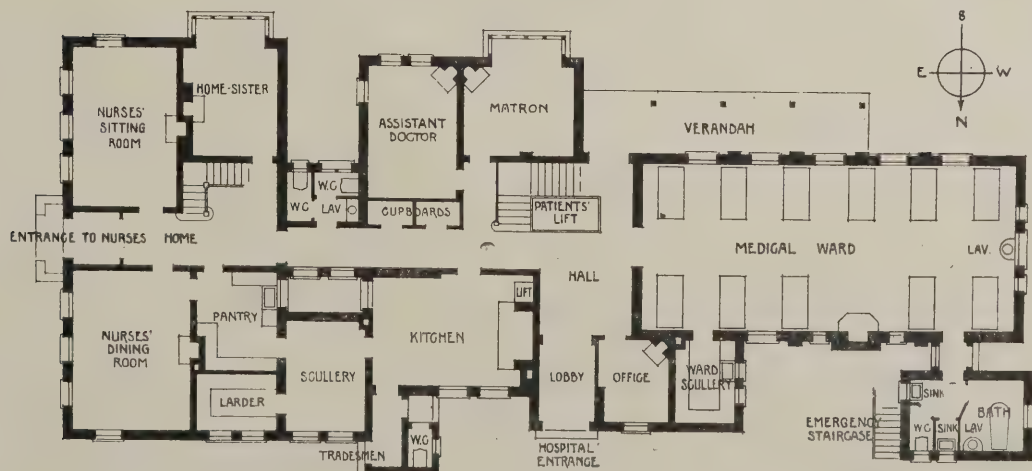
Mr. Brock's Bronze Statue of Millais in front of the Tate Gallery was unveiled on Wednesday last.

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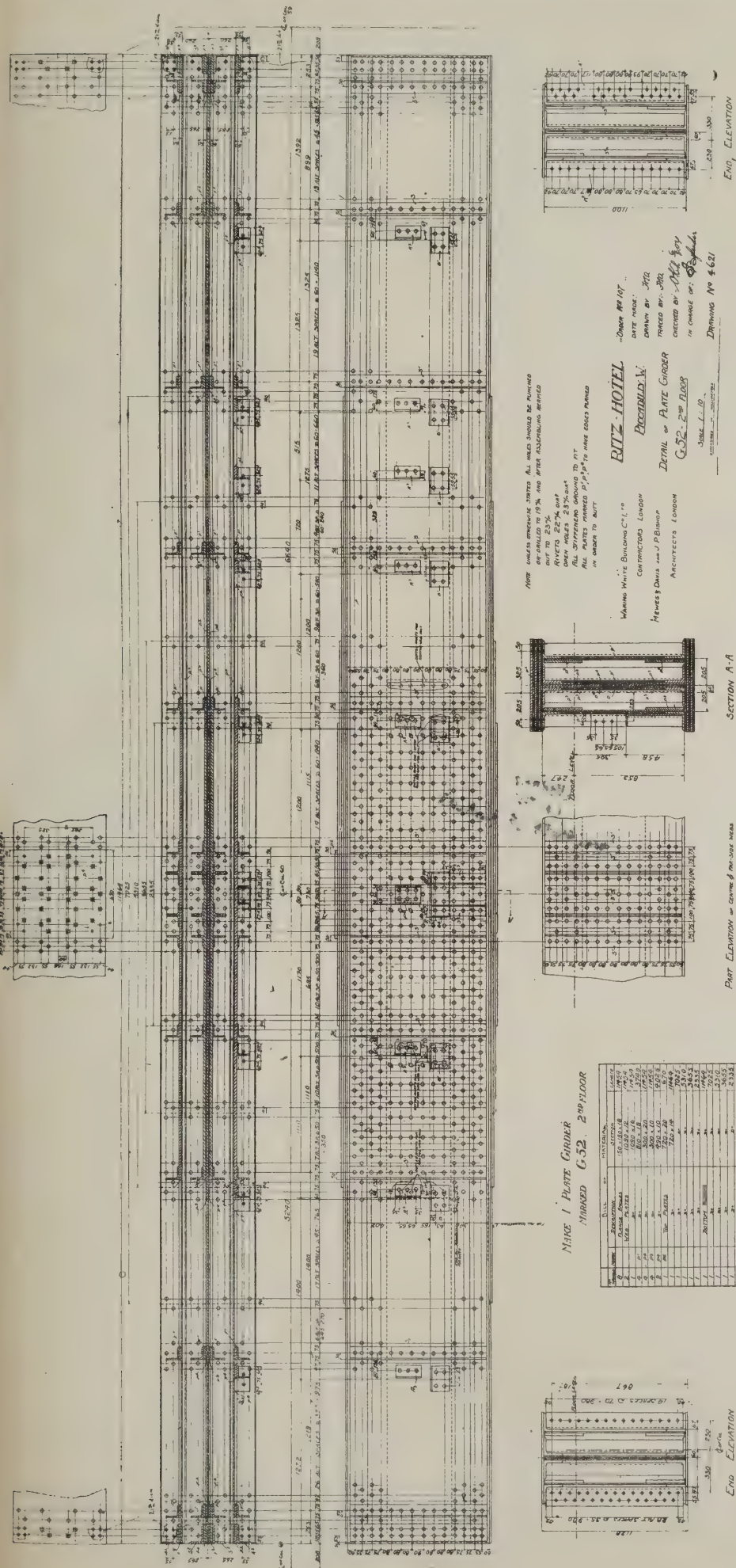


FIRST-FLOOR PLAN.



GROUND-FLOOR PLAN.

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A TRIPLE-WEB GIRDER.

ON this page we reproduce the shop drawing of one of the heavy triple-web box girders at the second-floor level of the Ritz Hotel, now nearing completion in Piccadilly, London. This girder carries the exterior wall and eccentric load from a column on the centre of the span. The box girder type was adopted because the load on the girder was not applied centrally with the girder, the width of the flanges being depended upon in calculating the resistance against twisting.

The loads are transferred from the flanges to the web-plate by means of angles and reinforcing plates, milled to butt against the upper flange of the girder and against the lower flange, as well as at supports.

The floor beams are connected to the girder by means of side connection-angles, and rest on seat-angles and stiffeners. The weight of one of these girders is about 18 tons.

NORTHERN ARCHITECTURAL ASSOCIATION.
President's Address.

THE Northern Architectural Association held the opening meeting of the session on Wednesday last at Newcastle.

The president (Mr. J. T. Cackett) in his inaugural address dealt at considerable length with the planning of Newcastle, reviewing the public improvements which have been made since 1840, when Richard Grainger, under the guidance of Mr. Dobson (past-president of the Association), had practically completed his reconstruction of the town. Mr. Cackett said he was forced to the conclusion that at present they were as much behind the times as their predecessors were in advance of their day. The improvements effected since 1840 were, of course, considerable, but he questioned whether they did anything more than provide for the bare necessities of the time. There could be no doubt that Newcastle from 1840 to 1860—before

the Abominable Practice

of obliterating a façade with enormous gilt letters and illuminated devices became the fashion—could compare most favourably with any city in Great Britain for fine streets, and was far ahead of any other town of its size. But could they point to a proportionate increase of streets of the quality and grace of those of 1840—in spite of the great development of education and artistic training? Unless they had thoroughfares roofed wide at least, capable of accommodating four rows of trams, it was hopeless, with the street surface only, to satisfactorily conduct the through traffic and stopping traffic on one thoroughfare; and since in the centre of the town they could not now hope to widen the streets throughout (although opportunities for this had in very recent years been missed) the remedy appeared to be to create new streets. One of the most desirable improvements would be to add to the usefulness of Percy Street—and thus relieve Grainger Street—by either improving the approach to it or making a new street to the north of Clayton Street. A street from the Monument to the Haymarket he also thought desirable, and he trusted the building of a free high-level bridge across the Tyne would not be long postponed.

The Latest Improvement

undertaken by the Council—the Market Street extension—would if properly carried out prove one of the greatest boons to the city since the days of Grainger; for it duplicated New Bridge Street, and so might relieve it of

the great amount of through traffic which so congested it now. But when they looked at the details of the scheme it seemed to leave much to be desired; and, in his opinion, it was a striking example of shortsightedness. For the ample provision of light and air, and certainly for aesthetic reasons, it was desirable that the height of buildings should be less rather than exceeding the width of the street; and when they considered this in conjunction with the increasing traffic, it seemed a serious mistake that this main thoroughfare should be only 60ft. wide. His criticism of the Market Street extension had tempted him to consider whether, by dealing with the matter as Grainger and Dobson certainly would have done, there was not room for a magnificent improvement to this part of the town, which would also be financially successful. The great expense of the scheme lay in the purchase of all the property between New Bridge Street and New Market Street and the old property to the south of New Market Street. With one or two unimportant exceptions, all the property in this area was old, and there were schemes for rebuilding a very considerable portion of it. Were this property bought up and the area laid out as he had planned, they would have blocks commensurate with modern requirements and with frontages which would command prices that would go far to pay for the scheme, even if it did not do more.

Builders' Notes.

Alderman Charles Carter, J.P., the new mayor of Poole, is the head of the well-known firm of Carter & Co., architectural ceramic and tile makers, Poole.

A Lady Builder is about to commence the erection of cottages at Letchworth (Garden City). The cottages are to be built under her sole supervision and control.

Mr. James Bromage, builder and contractor, Worcester, has been appointed sheriff of the city, and Mr. A. H. Constance, builders' merchant, the city chamberlain. Another builder and contractor, Mr. J. Sharman Wood, who is an ex-mayor of Worcester, is chairman of the Worcester Licensing Committee.

A Manchester Contract.—The contract for the extension of the London Road Station, Manchester, and the widening of the line to Ardwick, has been secured by Messrs. R. Neill & Sons, the amount mentioned being £150,000. The necessary demolition of property was completed some time ago, so that the excavations can commence at once. Some welcome work will be found for unskilled labour.

A Progressive Staffordshire Brick Firm.—At a time when one hears so much of decaying industries, especially in the Staffordshire brick trade, it is satisfactory to record an instance of progress such as the rejuvenation of the old-established blue and red brick and tile works of Messrs. W. E. Partridge & Co., at Kingswinford, Staffs, which was celebrated by the starting of the fine new engine and brickmaking machine that have been put down. Messrs. Partridge & Co. have had a long run as brick and tile manufacturers. The firm dates back far into last century, when the Kingswinford district was at its zenith as a brick and tile district. The products reached a high place in repute, but the old firm, content with their record, neglected to keep pace with the times. Now, however, the order of things has changed, and since the works have passed into the hands of Mr. J. E. Chambers they have been brought up-to-date. The brick machine is upon the wire-cutting principle, and will produce 15,000 bricks a day. It has been put down by Messrs. Parsons, Ltd., of Brierley Hill.

Masons object to Adamant Paving.—A deputation of operative masons at Aberdeen waited on Lord Provost Lyon last week to protest against the proposal to lay adamant pavement in Union Street. Both as regards economy and durability they thought the pavement ought to be relaid with granite.

A List of Plumbers.—One of the waterworks regulations in force in Leeds provides that anyone may employ a competent plumber to do work in connection with the internal distribution of water, "but the Corporation reserve to themselves the right of objecting to the employment of any plumber who may have wilfully infringed these regulations." In order to exercise this right the Waterworks Committee have decided to have compiled a list of plumbers in the city, and those who may have wilfully infringed the regulations for preventing waste and misuse of water will be struck off the list.

Wages in the American Building Trade: Strikes Threatened.—In the American building trade strikes of a disastrous character seem to be imminent unless wages are advanced. At present for an eight-hours' day bricklayers receive 22s. 6d., tilelayers 20s., sheet-iron workers, carpenters and house-smiths 18s., and painters 16s. per day, and double pay in each case for overtime. With the exception of the bricklayers, all the trades enumerated now demand an extra 2s. per day. It is quite on the cards that the employers, with a desire for the "open shop" system, may soon risk another fight with the unions, which so far have proved themselves masters of the situation.

Incorporated British Institute of Certified Carpenters.—The fifteenth annual report will be presented to the annual meeting to be held on Saturday next, December 2nd, at Carpenters' Hall. This states the Institute to be in a flourishing condition, with an encouraging outlook. During the past year twenty-eight new members have been elected, the total membership now standing at 181. For the first time a booklet containing a list of members' names and addresses has been issued this year. The council desire to inform provincial members who are unable to attend meetings that they will be pleased to receive papers from them, and that provision will be made for the reading of these papers.

Messrs. Minton, Hollins & Co., of Stoke-on-Trent, announce that in actions heard at Edinburgh in June last against Messrs. Cochran & Fleming, pottery and tile manufacturers, Glasgow, Messrs. Alexander Wilson & Co., tile layers and tile contractors, Glasgow, and Messrs. Cherry & Co., Ltd., tile layers and marble contractors, Glasgow, decrees were granted prohibiting the above-mentioned firms from manufacturing, selling or using tiles having the words "Minton, Hollins & Co., Patent Tile Works, Stoke-on-Trent," or any part of these words or combination of letters calculated to deceive the public into the belief that such tiles were made by Messrs. Minton, Hollins & Co.

Hydraulic Power for London.—The Metropolitan Water Board have decided that the restrictions which have hitherto prevented an extended use of the London Hydraulic Power Company's supply of high-pressure water for fire extinction is to be withdrawn, and in future it will be possible for anyone to have hydraulic pressure apparatus fitted subject to the domestic water used being passed through a meter. The injector hydrant combines in one jet the force and volume of both the hydraulic power and domestic supplies. In some districts in London served by the Hydraulic Power Co., under the regime of the old water companies injector hydrants have been in use for many years, but in the City and in other important districts it has been hitherto impossible to connect them directly to the water mains.

The South Staffordshire Smallpox Hospital, at Moxley, will be opened on Monday next, December 4th. It provides accommodation for forty patients and for a sufficient staff of nurses and officials to look after a larger number of patients should an epidemic arise. The hospital itself consists of three pavilions, two of which will accommodate sixteen patients each, and the third, an observation block for doubtful cases, eight patients. The floors are of teak, and the walls cement faced. The cost of the work, including the site, will be about £18,000.

Wallpaper Manufacturers, Ltd.—The directors' report for the year ending August 31st last, to be brought before the general meeting to-morrow, shows a profit of £243,227, to which must be added £115,514 brought forward from last year's account. After payment of interest on debenture stock, interim dividend on preference shares, and income tax, there remains the sum of £290,727 for further appropriation. This the directors propose to deal with as follows:—£24,986 final dividend on preference shares at 5 per cent., £87,356 to pay a dividend at the rate of 8 per cent. on the ordinary shares, £50,000 to be carried to the reserve fund, and £128,385 to be carried forward. The company has purchased as from January 1st last the Lin-crusta business of Messrs. Frederick Walton & Co., Ltd. In accordance with the articles of association, five of the directors retire by rotation, namely:—Messrs. A. W. Huntington, G. Kirby, G. W. Osborn, H. W. Sanderson and J. Walker, who, being eligible, offer themselves for re-election. The capital of the company is £3,200,000.

The Plumbers' Company.—At the recent annual banquet the Master of the Worshipful Company of Plumbers (Mr. W. D. Carøe, F.R.I.B.A.) said the objects of the Company were to promote the better training of the coming generations of plumbers by a proper system of apprenticeship, combined with technical education, suited to the modern conditions of labour, and to maintain a high standard of plumbers' workmanship, and thus place the trade in its right position to secure the confidence of architects and authorities acting on behalf of the public. In these objects the Company had the hearty co-operation of the working plumbers in the United Operative Plumbers Association.—At a conference of the committee of representatives of district councils acting in conjunction with the Worshipful Company of Plumbers for the national registration of plumbers, held recently at the Guildhall, resolutions were adopted declaring that no applications for registration upon the submission of proofs of qualification would be received after December 31st, and approving generally the principle of apprenticeship and the keeping of a register of apprentices. Mr. W. R. E. Coles, secretary to the Company, submitted a report upon the negotiations which have been in progress between the Board of Education and representatives of the Lancashire County Council, the Master and Operative Plumbers' Associations, and the Plumbers' Company for the unification of examinations for the purposes of registration. A question had arisen in respect to the City and Guilds of London Institute. The Institute were quite willing to conduct examinations in plumberwork and to give the Plumbers' Company a voice in the appointment of the examiners, but they insisted that they should issue the certificates, and that then, if the holders of them desired to do so, they could send them to the Plumbers' Company to be countersigned. A resolution was passed expressing the opinion that no certificate would be satisfactory unless, before issue, the same was signed by the Company.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Determining Safe Load on Rolled Joists.

BRADFORD.—CANTILEVER writes: "A rolled steel joist 40ft. long, 10ins. deep, 5ins. wide, and 1/2in. thick throughout is continuous over three supports, forming two spans of 20ft. each. What uniformly distributed load would produce a maximum stress of 5 1/2 tons per square inch? Sketch the diagrams of bending moments and shearing force. Please also explain what is meant by the radius of gyration, and give an example of its use."

Draw the linear elevation, Fig. 1, and indicate the loading. The bending moment diagram will then be as Fig. 2. The maximum bending moment will be over the central support = $\frac{wl^2}{8}$; then Effort = Resistance,

bending moment M = moment of resistance R; R = modulus of section z by modulus of rupture c, so that $\frac{wl^2}{8} = zc$;

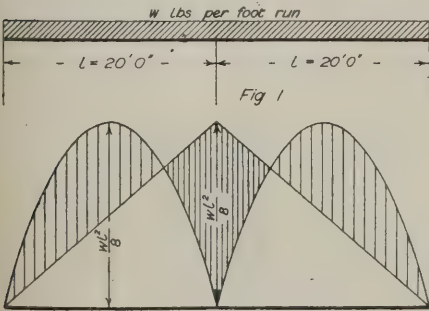
$\therefore w = \frac{8zc}{l^2}$. Now $z = \frac{5 \times 10^3 - 9^3(5 - \frac{1}{2})}{6 \times 10}$

$= \frac{5000 - 3280}{60} = 28.6$, $c = 5 \frac{1}{2}$ tons per square

inch, $l = 20 \times 12 = 240$ ins., therefore $w = \frac{8zc}{l^2} = \frac{8 \times 28.6 \times 5.5}{240 \times 240}$ = .022 tons per inch

run, or multiplying by 12 = .264 tons per foot run, uniformly distributed load, or for 20ft. span a distributed load of 5.28 tons. Dorman, Long & Co.'s *G 10A 10 by 5 by 29lb., which is the nearest section, at 6.4 tons per square inch will carry over the same span a load of 7.5 tons, practically proving the above calculations. The radius of gyration can be best explained by reference to mechanics. If a thin lamina of the cross-section be rotated about one edge, the radius of gyration is the distance from that edge to the point at which, if the whole mass were collected, the accumulated work per revolution would remain the same. It is a measure of the leverage of resistance of any section, as in the case of a strut, where the whole resistance is made up of the strength of the material, the area of the cross-section, and the disposition of that area with regard to the edge round which bending takes place. The radius of gyration measures the effect of the area and the way it is arranged. The square of the radius of gyration is the moment of inertia divided by the area, or

$r^2 = \frac{I}{A}$, whence $r = \sqrt{\frac{I}{A}}$. Rankine's modification of Gordon's formula uses the radius of



DETERMINING SAFE LOAD ON ROLLED JOISTS.

gyration instead of the least diameter in the calculation of struts, with the requisite modification of the constants, as the calculations are then found to be more in accord with the result of experiments.

HENRY ADAMS.

A Small Baptistry.

CRIEFF.—SUBSCRIBER writes: "I have prepared plans for a small hall which extends over several shops and an entrance, and am now requested to provide for a baptismal tank at the platform for occasional baptisms. What would you suggest as the best way of doing this? I send sketch-plan showing the position of the platform, which is situated immediately over the entrance already referred to. I suppose the tank must be placed in the platform? What should be the size? Should there be steps down into the tank? Would a concrete tank lined with tiles, and set on steel beams flush with the platform floor, do? What depth of water should be in the tank? Should the water be heated, and how? The platform will be about 2ft. above the hall floor."

A section should have been given showing the height of the platform and the walls below, also a plan showing the construction of the floor. The cheapest arrangement would probably be a zinc-lined wooden tank, carried on rolled joists, and enamelled white inside. The length may be, say, 9ft., the width 5ft., the depth 2ft. 6ins., and the depth of water 1ft. 6ins. Steps down one corner. Fig. 1 shows plan with assumed arrangement of floor joists; Fig. 2 cross-section showing movable platform in position by dotted lines. Fig. 3 shows horizontal section with position of rolled joists and ceiling joists over passage. Fig. 4 shows cross-section of platform which may be made portable by having the flooring in, say, two

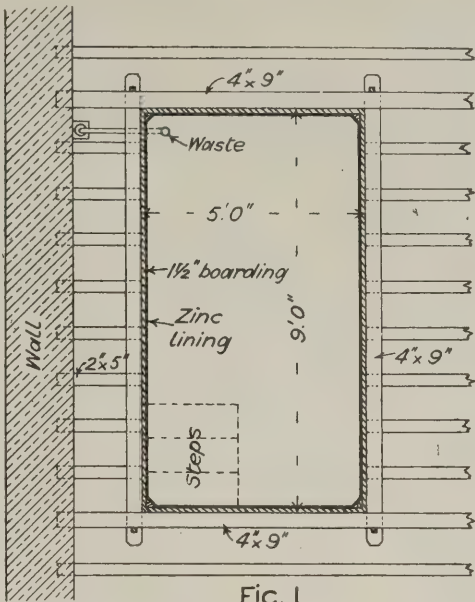


FIG. 1

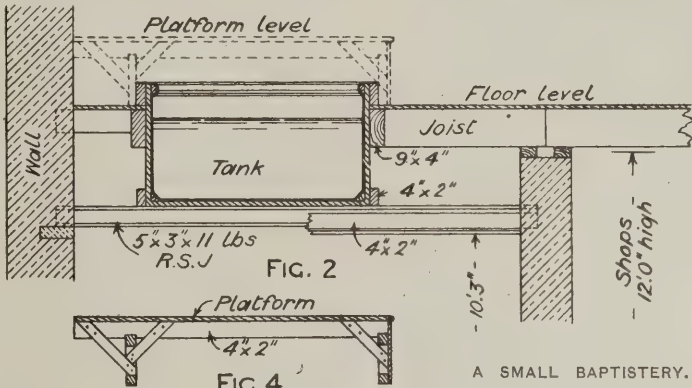


FIG. 2

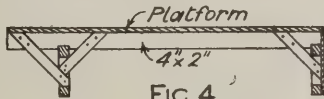


FIG. 4

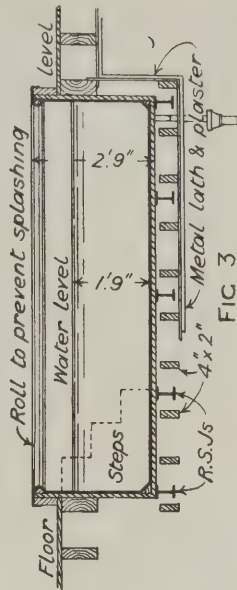


FIG. 3

A SMALL BAPTISTRY.

pieces and the framework in another piece: or a far better arrangement would be to cut it through the centre and have each half running outwards on small wheels and flush rails, but this would mean the removal of some seating accommodation. It is not usual to have heating arrangements, but a geyser could be fitted. The water-supply and waste can be arranged on the spot.

HENRY ADAMS.

Indentures.

GOOLE.—A. B. C. writes: "What are the usual conditions contained in the articles of indenture for a pupil aged sixteen years entering the office of an architect and surveyor in a small provincial town? I want to know the usual period, amount of premium, &c."

The period of service varies from three to five years, but is more generally three years where a pupil can attend a good training centre. Failing this, four or five years would be advisable. Two forms of indenture approved by the Royal Institute of British Architects are published, one for the payment of the premium in one sum and the other for payment in instalments. These can be obtained from the offices of the Institute at 9, Conduit Street, Regent Street, London, W., price 1s.

Walls of Adjoining Owners.

LONDON.—LUNA writes: "I am about to utilize a site which lies between two houses. I take it that the walls of the adjoining owners are external walls. Can I build the walls of my house against those of my neighbours, and in so doing shall I be compelled, in compliance with the London Building Act, to serve notices on the adjoining owners before the work is commenced?"

If you propose to build entirely upon your own land, and do not intend to claim to use

either of the adjacent walls as "party-walls," there is no need to serve any notices upon your neighbours. Of course your plans must be deposited with the local authority for approval in accordance with the by-laws.

F. S. I.

The T-Square Club.

LONDON.—R. N. writes: "Is this club still in existence? If so, please give name and address of secretary."

We understand the club has ceased to exist for about a year now.

Openings for Architects in Canada.

SHEPPERTON.—S. H. writes: "Are there any vacancies for architects' draughtsmen in Canada? Where could I get full information? Could you give me the address of the best Canadian paper to advertise my want in?"

So far as we are informed Canada offers no special opportunities to architects' assistants. But we suggest that you apply to the Emigrants' Information Office, Broadway, Westminster, and to the Canadian Government offices in Victoria Street, S.W. The best Canadian paper to advertise in is "The Canadian Architect and Builder," published monthly by the C. H. Mortimer Publishing Co., Ltd., Confederation Life Building, Toronto, Canada.

Flooring for Cottages.

MANCHESTER.—F. J. A. writes: "(1) In the book of plans, &c., of Garden City cottages a material called 'Stonwod' is mentioned in several places. It is evidently laid on concrete to do away with wood floors and their possibilities of dry-rot. I am thinking of building some cottages, and would like to do without wood floors if I can find a substitute—the tenants do not like concrete, it is too cold. 'Stonwod' claims to be as warm and quiet as wood. I shall be glad to hear anyone's experience of it. Where can I obtain particulars of either this or any other device in lieu of wooden floors? (2) In your issue for November 1st is a sketch of a kitchen range set in a semi circular arch of salt-glazed bricks, doing away with iron pilasters, &c. Is this a special range? I assume it is, as an ordinary range has a flat top and is recessed behind the pilasters."

(1) "Stonwod" is warmer than concrete, quiet, and would do admirably for the ground floors of cottages. For particulars apply to the Stonwod Fireproof Flooring Co., Ltd., 109, Victoria Street, Westminster. A very similar material is "Eubœolith," supplied by Mr. J. Percy Day, 3, Victoria Street, Westminster. (2) The range to which you refer is in the cottage designed by Mr. Percy B. Houfton. It is a special one, without back plates, and was made by Mr. A. Green, stove grate manufacturer, Whittington Moor, near Chesterfield. The lining behind the fire is in firebrick. Pressed or glazed bricks may be used on each side of the firebrick centre-piece, taking the place of the usual cast-iron plates.

Leaded Lights.

STREATHAM.—C. W. T. writes: "What do the London County Council mean by glass in city buildings 'to be fireproof'? Does this necessarily mean that only 'Luxfer glazing,' made by the British Luxfer Prism Syndicate, Ltd., must be used? I wish to know if leaded lights can be employed in any way."

Leaded lights are very far from fire-resisting. What is referred to is "Luxfer glazing" or wired glass.

Whitening Cement-concrete; Timber Sizes.

HARROW.—A. R. B. writes: "(1) Can you suggest any method of whitening, or making so as to weather white, or altering the colour of, cement-concrete steps, copings, &c., other than: with Portland stone chippings? Do

you think that the addition of whitening or chalk would have any effect? (2) In what book can I find the stock sizes of timbers, &c.?"

(1) White spar would be a better aggregate than Portland stone chippings as regards whiteness, but it is not necessary to make the whole of the steps throughout with a special aggregate: the core may be made with an ordinary aggregate such as furnace ashes, and a fine facing cast on to it, this being done by putting the facing material into the mould first and then shovelling in the rougher material. For the facing silver sand might be used, but this would not be advisable alone as giving shortness which would cause steps to wear away with the traffic, but it might be used with white spar. A whitish cement should be carefully chosen, and a very small amount of whitening would add whiteness and not cause harm. Another method would be to go in for a white terrazzo face made by putting white marble chippings or white spar into the mould first before pouring in the concrete, afterwards rubbing down the face to bring out the white material and polish it. Such work is done by several concrete firms such as Messrs. B. Ward & Co., Ltd., of Grosvenor Works, Bedford; Messrs. W. B. Wilkinson, of 13, St. Mary's Place, Newcastle-on-Tyne, and Messrs. Hodkin & Jones, Ltd., of Havelock Bridge, Queen's Road, Sheffield. (2) There are no hard and fast sizes, though some are in more general use than others. These can be ascertained from "Specification" and other books on construction, timber trade periodicals and also our list of "Current Market Prices."

Shop Fronts.

PLYMOUTH.—A. W. P. writes: "(1) In Mitchell's 'Advanced Building Construction' the author says that in a street more than 30ft. wide any shop front may project 10ins., and no more, over the boundary line. Does this apply to the fascia and sill-piece, &c., or to the pilasters at either end? Mitchell shows base of pilaster 13ins. over boundary. Would this be allowed? (2) When a section of foundations to a shop front 36ft. wide is asked for at an examination, would it be advisable to show a basement with pavement lights and bulk-head, &c.?"

(1) The passage to which you refer applies to any kind of projection beyond the frontage line. In some cases the rule that there shall be no projection whatever is rigidly enforced, but, speaking generally, the question depends upon the reasonableness or otherwise of the local authority enforcing the by-laws in the particular district. (2) In an examination question you would probably be told exactly what is required, but in case of obscurity the method you suggest would no doubt form an excellent answer.

F. S. I.

Oak Gate-posts.

LONDON.—W. J. C. & S. write: "Is there any wood more durable and as cheap as oak for front gate-posts? We have fixed large numbers of 8 x 8 and 10 x 10 oak posts, and find that in seven or eight years they rot nearly through on the ground line. This may be due of course to sap in some cases, as we find it difficult to obtain oak without sap in the sizes mentioned."

We suggest jarrah and karri.

Articles.

BROMSGROVE.—F. E. O. writes: "My brother while studying at a school of art took a liking to architectural design, and with the idea of getting practical experience came to terms with a firm of builders to learn the different branches in their shops. He is now acting as assistant to a fairly well-known architect. Will his lack of articles handicap him in obtaining a position as architect or

assistant with a larger firm of architects, or is it possible to purchase his articles?"

The fact of having been articled does not prove anyone to be duly qualified as an architect or to have ability. We do not think the want of articles is detrimental to an architect or his assistant. What is necessary is that an assistant should have ability and be able to prove it by testimonials and examples of his work. The possession of certificates of having passed examinations is also undoubtedly a help, and we should advise every student to take the examinations of the Royal Institute of British Architects. The Surveyors' Institution examinations are also to be recommended for those taking up that particular branch of professional practice.

NEW LONDON BUILDINGS.

AT last week's meeting of the London County Council the Building Act Committee reported the following application under the London Building Act, 1894, their consent or refusal being appended in italics:—

A shop front at No. 119, Pall Mall, on the application of J. A. Minty, on behalf of Hugh Rees, Ltd. (*Consent.*)

A new shop front with entablature at No. 56, High Road, Kilburn, on the application of G. A. Sexton, on behalf of D. Fearn & Co. (*Consent.*)

Projecting sign and two show cases at the "Green Shade," Argyl Street, Oxford Street, on the application of W. Lockwood, on behalf of A. Weiner. (*Consent.*)

Retention of three projecting signs at Nos. 22 and 23, Long Acre, on the application of Windover, Turrill & Sons. (*Consent.*)

Projecting sign at No. 252, Tottenham Court Road, on the application of Wakelin & Co., on behalf of Wolfe & Hollander, Ltd. (*Consent.*)

Projecting sign at No. 18, Archer Street, Kensington, on the application of W. Douglas, on behalf of the British and Continental Drug Co. (*Consent.*)

A projecting sign at No. 50, King Street, Regent Street, on the application of R. H. Kerr, on behalf of Chapman. (*Consent.*)

Projecting sign at No. 4, Foubert's Place, Regent Street, on the application of R. H. Kerr, on behalf of Chapman. (*Consent.*)

Projecting sign in front of No. 12r, Victoria Street, Westminster, on the application of A. C. Forrester, on behalf of F. Hazell. (*Consent.*)

Projecting sign at No. 26, Gray's Inn Road, Holborn, on the application of Caspar & Co. (*Consent.*)

Projecting porches at Nos. 48, 50 and 58, and to the erection of a similar porch at No. 52, Forest Hill Road, Lewisham, on the application of J. Newton. (*Consent.*)

A building on the northern side of Broughton Road, westward of Stephendale Road, Fulham, on the application of Badenoch & Bruce, on behalf of the directors of the Sunlight Laundry Co. (*Consent.*)

Projecting clock at No. 108, Norwood Road, Norwood, on the application of Gillett & Johnston, on behalf of M. Philcox. (*Consent.*)

Three houses on a site abutting upon the northern side of Warple Way and western side of Warple Road, Wandsworth, with external walls and forecourt boundary at less than the prescribed distance from the centre of the roadway of Warple Road, on the application of F. Dolley. (*Consent.*)

An addition to a block of dwelling-houses to be inhabited by persons of the working class on the north side of Sumner Street, Southwark, on the application of F. Bailey, on behalf of the City of London Electric Lighting Co., Ltd. (*Consent.*)

Buildings on the east side of Georgette Place, King George Street, Greenwich, with external walls and forecourt boundaries at less than the prescribed distance from the centre of the roadway of Georgette Place, on the application of H. Adams. (*Refusal.*)

Buildings upon the site of Nos. 232, 234, 236 and 238A, Rommany Road, West Norwood, on the application of J. Stevens. (*Consent.*)

Retention of a wood and glass addition upon the bay window in front of No. 124, Victoria Street, Westminster, on the application of Griffin & Woollard, on behalf of J. B. Martin. (*Consent.*)

Retention of a building on the western side of Church Path, Stoke Newington, on the application of W. F. May, on behalf of J. Gregory. (*Consent.*)

A kiosk at the western end of the Hyde Park Hotel, Knightsbridge, on the application of F. Gregory, on behalf of Newitt & Phillipp. (*Refusal.*)

Re-erection of No. 4, George Street, Woolwich, on the application of J. O. Cook, on behalf of J. Frankling & Son. (*Refusal.*)

A workshop building on the northern side of Richmond Terrace, Clapham Road, Kennington, westward of No. 90, Clapham Road, with the forecourt boundary at less than the prescribed distance from the centre of the roadway of Richmond Terrace, on the further application of J. A. J. Woodward & Son, on behalf of C. Blachford. (*Consent.*)

Retention of a wood and iron structure of a temporary character erected on the forecourt of No. 48, Victoria

Road, Kensington, on the application of W. K. Peirson, on behalf of A. J. de Beaufort. (Consent.)

Alterations at No. 7, Noel Street, Soho, on application of G. C. Lambert. (Consent.)

New streets on the Durnsford Park Estate, Merton Road, Wandsworth, on application of R. C. Gordon, on behalf of A. Wise. (Consent.)

New streets, for foot traffic only, upon a site on the south side of Fashion Street, Commercial Street, Whitechapel, on application of A. Davis. (Consent.)

Alterations to No. 28, High Street, Putney, on application of H. Bignold. (Consent.)

The Theatres and Music Halls Committee reported having considered the following:—

A plan, submitted by Blow and Billerey, showing stalls seating at the Avenue Theatre. (Refusal.)

A plan, submitted by W. Bartholomew on behalf of J. H. Beare, for a new hall which has been erected on the land adjoining the minor hall at the Balham Assembly Rooms. (Approval.)

Plans, submitted by F. Matcham & Co., on behalf of Moss Empires, Ltd., showing arrangements proposed to be adopted in the erection of a music hall, to be known as the Finsbury Park Empire, on a site at the junction of St. Thomas's Road and Prahr Road, Finsbury Park. Accommodation is shown for an audience of 2,138 seated and 535 standing. (Approval.)

Plans, submitted by F. W. Hingston on behalf of Walter Stephens, showing arrangements to be adopted in the construction of a music hall to be known as the Kilburn Vaudeville Theatre, proposed to be erected at Kilburn High Road, with a frontage on Kilburn Priory, and in respect of which an application has been made for a music and dancing licence. Accommodation is shown for an audience of 1,629 seated and 284 standing. (Approval.)

Plans, submitted by Smee & Cobay on behalf of Miss Kate Santley, for raising the stage roof at the Royalty Theatre and providing a new staircase and dispensing with the existing staircase from the stalls corridor to the basement, opening on to the stairs from the pit saloon to the pit entrance. (Approval.)

A plan, submitted by J. G. W. Buckle on behalf of J. N. Maskelyne, showing a proposal to convert the present vestibule to the offices on the first floor at St. George's Hall, Langham Place, into a refreshment bar for the use of the balcony audience. (Approval.)

Plans, submitted by H. & G. Taylor, of a proposed alteration in the arrangement of the gentlemen's retiring room at the Sportsbank Hall, Catford. (Approval.)

Plans, submitted by F. T. Verity, showing a proposed new staircase to lead from the box circle level up to the grand foyer at the Empire Theatre of Varieties. (Approval.)

Plans, submitted by Nelson Francis, showing the position of the cinematograph apparatus box which has been fixed in the gentlemen's lavatory, at the back of the balcony at the Empire Theatre of Varieties. (Approval.)

Plans, submitted by A. Corder on behalf of the Rev. Andrew Mearns, showing the alterations which have been made to the Murphy Memorial Hall. (Approval.)

A plan, submitted by Dióyal Symons, showing a proposal to discontinue the use of two staircases at the eastern end of the gallery at Olympia as emergency exits and to use a room on the gallery level for electrophone purposes. (Approval.)

Plans, submitted by Bull & Bull, showing the arrangement of the seating at Olympia, proposed to be adopted in connection with the use of the premises as a winter sports club during the winter. (Approval.)

Plan, submitted by the Town Clerk of the Metropolitan Borough of Paddington, showing a proposal to remove the dressing boxes from the sides of the men's first-class swimming bath at the Paddington Public Baths, when it is converted into a concert hall, and to provide platforms 3ft. 6ins. in width and 6ins. in height in their place, the platforms to be occupied by a single row of chairs. (Approval.)

At yesterday's meeting the Committee reported the following applications under the London Building Act, 1894:—

Buildings on a site abutting upon the southern side of West End Lane and eastern side of Credition Road, Hampstead, on the application of R. L. Pearce, on behalf of the Middlesex Building Co. (Consent.)

Three-storey buildings with shops on the eastern side of Garratt Lane, Wandsworth, northward of St. Andrew's Church, on the application of L. S. Rogers, on behalf of J. & R. Heard. (Consent.)

Iron and glass hood over the entrance to No. 148, Goldhurst Terrace, South Hampstead, on the application of James & Laycock, on behalf of Mrs. Beedell. (Consent.)

Three houses with shops on a site abutting upon the west side of Grove Lane and north side of Champion Grove, Camberwell, on the application of R. L. Freeman, on behalf of T. Freeman. (Consent.)

Buildings on the west side of Wordsworth Road, Stoke Newington, southward of the Baptist chapel, on the application of C. M. Cobb, on behalf of A. J. Weibking. (Consent.)

An iron and glass porch at No. 1, Hyde Park Terrace, Bayswater Road, Paddington, on the application of R. L. Cole, on behalf of S. N. Braithwaite. (Consent.)

Buildings on the site of Nos. 66, 67 and 68, Clapham Common, South Side, Clapham, on the application of Homer & Lucas. (Refusal.)

Mission hall upon the site of Nos. 211 and 213, Sydenham Road, Lewisham, with a boundary fence at less than the prescribed distance from the centre of the roadway of Laurel Grove, on the application of E. Harper & Brother. (Consent.)

The formation or laying-out of new streets for foot traffic only, and in connection therewith the erection of buildings and an iron and glass shelter upon a site on the southern side of Highgate Hill and western side of

Junction Road, Islington, on the application of C. W. Callcott, on behalf of J. W. Galton. (Consent.)

Buildings on a site abutting upon the east side of Urswick Road, south side of Lesbia Road, and north side of College Avenue, Hackney, on the application of J. G. Tewson, on behalf of D. Burnett. (Consent.)

A sign on the ridge, and electric lamps round three sides of the iron and glass shelter at Hatchett's Restaurant, Piccadilly, on the application of W. M. Kolton. (Consent.)

An addition at the rear of No. 292, Merton Road, Wandsworth, to abut upon Standon Road, on the application of W. G. James, on behalf of H. J. Bailey. (Consent.)

Crane opposite Nos. 42 and 44, Bankside, Southwark, on the application of A. Harrison, on behalf of the Council of the Metropolitan Borough of Southwark. (Consent.)

Deviations from the plans and sections sanctioned on the 31st day of January, 1905, and 1st day of August, 1905, for the formation or laying-out of new streets on the St. Quintin Estate, Quintin Avenue, Kensington, on the application of Trant, Brown & Humphreys. (Consent.)

A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of a house on the north-western side of Atherfold Street, Clapham, on the further application of V. Vagnolini, on behalf of W. P. Goosey. (Consent.)

A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of three blocks of artisans' dwellings on a site on the east side of Stockwell Road and south side of Moat Place, Brixton, with irregular open spaces at the rear, on the application of P. Tree, on behalf of Foster's Trustees. (Consent.)

A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of a building on Lot 2, Tower Bridge Road, Bermondsey, on the application of Barlow, Roberts & Thompson. (Consent.)

A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of eleven houses on the northern side of Lamerton Street, Deptford, on the application of G. A. Lansdown, on behalf of J. E. Lamerton. (Refusal.)

Means of escape in case of fire, proposed to be provided in pursuance of section 63 of the London Building Act, 1894, on the topmost storey of Nos. 226 and 227, Piccadilly, the upper surface of the floor of which storey is above 60ft. from the street level, on the application of H. A. Woodington. (Consent.)

Keystones.

Change of Address.—Messrs. Knightley & Batterbury have removed their offices from 106, Cannon Street to Birkbeck Bank Chambers, Chancery Lane, W.C.

Messrs. Foyers & Penman, architects, of Largs, have been asked by Mr. George Coats to design extensive enlargements and alterations on his highland mansion of Glen Tana.

The National Monument to Victor Emmanuel at Rome.—The Minister of Public Works has appointed three architects (Signori Pio Piacentini, Gaetano Koch and Manfredo Manfredi) to continue this unfinished work of Count Sacconi, who died a short time ago. The selection seems to be disapproved in many quarters.

Proposed new Infirmary for Plymouth.—After an uproarious meeting the Plymouth Board of Guardians decided last week to approve the plans for their proposed new workhouse infirmary which had been drawn up by Messrs. Thornely & Rooke, architects, of Plymouth and Devonport. These plans will now go before the Local Government Board. A scheme was prepared some time ago, estimated to cost £56,000, but was rejected as being too expensive. The revised scheme provides for 300 patients and 21 nurses, and, at £100 per bed, is estimated to cost something over £30,000. The wards are grouped centrally around the administrative block.

Iona.—In a paper on "The Shrine of St. Columba at Iona" read recently at Glasgow University Mr. John Honeyman, LL.D., R.S.A., said there were indications that at one period—probably in the beginning of the thirteenth century—the choir of the Abbey Church had beneath its east end a crypt with side aisles. He thought that enough remained at Iona to show that the general arrangement of the plan at Amalfi, Iona, and the original crypt at Glasgow were similar, and gave reasons for believing that they were intended to serve the same purpose, namely, to cover the grave or preserve the relics of the patron saint in such a position

that when the choir was built the high altar might be placed exactly over the consecrated spot below.

New Premises for the National Society in Great Peter Street, London, S.W., have been built from designs by Mr. H. W. Burrows, F.R.I.B.A., F.G.S.

Sheffield Society of Architects and Surveyors.—At last Thursday's meeting Mr. J. R. Wigfull, A.R.I.B.A., delivered the second of his series of lectures on "English Renaissance Architecture," dealing with the period from 1600 to 1650.

Savoy Chapel Re-decorated.—After extensive re-decoration of the interior by order of the King, the Royal Chapel of the Savoy has been reopened. The work has been done by Messrs. Clayton & Bell. The chief aim was to lighten the interior, to which end the roof has been treated on a field of white. The walls also are much lighter in effect.

The Leeds Memorial to Queen Victoria, which has been erected in front of the Town Hall, was unveiled on Monday by the Lord Mayor (Mr. Edwin Woodhouse). The monument consists of a bronze seated statue of Queen Victoria, 9ft. 6½ins. high, on a square stone pedestal which rises to a height of 20ft. On either side of the pedestal are bronze figures, each 7ft. 6½ins. high, representing Peace and Industry. The sculptor was Mr. G. J. Frampton, R.A.

The Society of Architects has made a special donation of fifty guineas to the funds of the Architects' Benevolent Society in response to Mr. Belcher's recent appeal, and Mr. Walter W. Thomas, the immediate past-president of the Society, has given ten guineas, while other members have intimated their intention of also contributing.—The following have been elected members of the Society:—R. H. Boyd (Tooting Common), E. W. Burnet (Bridgend), G. W. Davis (Darlington), E. Drew (Swindon), A. H. Fitzgerald (North Shields), H. F. Keighley (Accrington), A. G. Latham (Birmingham), A. J. McDonnell (Forest Gate), F. Mountain (Oxford), H. E. Nicholls (Swindon), H. E. Priestley (Bradford), C. W. W. Thompson (Rochester). The following have been elected students of the Society:—W. J. Clements (Skewen, near Neath), A. H. Dungay (Camberley), F. Wakeling (Southall).

Restoration of St. Columb Major Church.—The venerable church of St. Columb Major, Cornwall, which has been undergoing renovation during the past five years (under the direction of Mr. G. H. Fellowes Prynne) was reopened on Wednesday last. The church dates from about the twelfth century, but little of the original structure remains. The present edifice, undoubtedly one of the finest in Cornwall, is in the main of fifteenth-century work, of Pentewan and Caen stone. Irreparable damage was done to the church, however, during the restoration of fifty years ago, when the whole form of the original chancel and side chapel roofs was altered, and the fine old oak barrel roofs with carved ribs and bosses were replaced by commonplace open timber deal roofs. The cost of the present restoration has been nearly £6,000. The completed work comprises the nave, aisle and transept roofs, which have been renewed, re-using the old carved oak ribs, plates and bosses as far as possible, and keeping the existing forms of roof intact, while new bosses have been added. The ringers' floor has been repaired, the clock and belfry floors and tower roof have been entirely renewed in oak, and the peal of eight bells has been rehung, whilst the tower has been thoroughly restored. A new feature is a richly-carved oak chancel arch, which completely hides the unsightly opening formerly existing where the chancel and nave roofs met.

Complete List of Contracts Open.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
Nov. 30	Edinburgh—Additions to Asylum	Royal Blind Asylum	Henny & Macleaman, Architects, 7 South Charlotte Street, Edinburgh.
" 30	Plymouth—Police and Fire-station	Council	J. Paton, Borough Engineer and Surveyor, Plymouth.
" 30	Styal—Homes	Guardians	J. W. Beaumont & Son, Architects, 10 St. James's Square, Manchester.
" 30	Uffington—Alterations to School	Managers	G. Cosser, Post Office, Uffington.
" 30	Bournemouth—Schools	Education Committee	Borough Engineer, Bournemouth.
" 30	St. Austell—Alterations to Chapel		J. Mutton, Architect, Charlestown, St. Austell.
" 30	Henfaes Bridge—Wall		C. H. Mounsey, County Surveyor, Carmarthen.
" 30	Pontardawe—Goods Shed		Engineer's Office, Derby Station.
Dec. 1	Heacham—Schools, &c.		H. J. Green, Architect, Castle Meadow, Norwich.
" 1	St. Albans—School		U. D. Smith, County Surveyor's Office, Hatfield.
" 1	Thetford—Enlargement of School		A. F. Scott, Architect, Castle Meadow, Norwich.
" 1	Burgh-next-Aylsham—School		A. F. Scott, Architect, Castle Meadow, Norwich.
" 1	Limavady—Hall		D. Conroy, Architect, 21 Shipquay Street, Londonderry.
" 1	Maes-y-Coed—House		A. O. Evans, Williams & Evans, Architects, Pontypridd.
" 2	Clayton West—Cloakroom, &c.		J. Vickers-Edwards, Architect, County Hall, Wakefield.
" 2	Finningley—Cloakroom		Schoolhouse, Finningley, Doncaster.
" 2	Renishaw—Alterations to School		F. H. Fisher, Architect, The Mount, Killamarsh, Sheffield.
" 2	Darlington—School		Education Offices, Stafford.
" 4	Bradford—School Department		Education Offices (Architects Department), Manor Row, Bradford.
" 5	Durham—Repairs, &c.		W. Rushworth, Architect, County Education Offices, Durham.
" 5	Durham—Connecting Latrines, &c.		W. Rushworth, Architect, County Education Offices, Durham.
" 5	Egremont—Alterations		J. Cown, Town Hall, Egremont, Cumberland.
" 5	London, S.W.—Re-tiling Bath		Works Department, Westminster City Hall.
" 5	Guston, Dover—Duke of York's Military School		H.M. Office of Works, Storey's Gate, London, S.W.
" 6	Hull—Superstructure of New Post-office		H.M. Office of Works, Storey's Gate, London, S.W.
" 6	Braintree—Partitions, &c.		F. Whitmore, Architect, Duke Street, Chelmsford.
" 6	Llandoverly—Alterations, &c.		A. S. Williams, Architect, Llandilo.
" 8	Pinged—Conveniences, Boundary Walls, &c.		W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Llechfyedach—Repairs to School		W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Llanwrda—School Alterations, &c.		W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Alltwales—Repairs and Ventilation		W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Pontyates—Repairs to School		W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Barfield Sailing—School		F. Whitmore, County Architect, Duke Street, Chelmsford.
" 8	Great Bardfield—Alterations to School		F. Whitmore, County Architect, Duke Street, Chelmsford.
" 8	Peckham, S.E.—Sorting-office		J. Wager, H.M. Office of Works, Westminster, S.W.
" 9	Tottenham—School		G. E. T. Laurence, Architect, 22 Buckingham Street, Adélphi, W.C.
" 9	Bungay—School		A. Pells, Architect, Beccles, Suffolk.
" 9	Heston—Alterations to Schools		A. Lancelot Lang, Architect, Council House, Hounslow.
" 11	Barming Heath—Connecting Covered-way, &c.		W. J. Jennings, Architect, 4 St. Margaret's Street, Canterbury.
" 11	Acton—Magistrates' Court		H. T. Wakelam, County Architect, Middlesex Guildhall, Westminster.
" 11	Brentford—Additions at Town Hall		H. T. Wakelam, County Architect, Middlesex Guildhall, Westminster.
" 15	Bromley—Convenience		Superintending Architect's Department, 15 Pall Mall East, S.W.
" 19	Kirton—School		J. Rowell, Architect, Church Lane, Boston.
No date	Cardiff—Alterations to House		W. Beddoe Rees, Architect, 3 Duffries Place, Cardiff.
"	Duckmanton—Huts		Brodsworth Main Colliery Co., Duckmanton, Chesterfield.
ENGINEERING:			
Dec. 1	Ingatestone—Pumping Machinery	Rural District Council	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford.
" 2	Sleaford—Water-wheel, &c.	Urban District Council	J. Clare, Surveyor, Sleaford.
" 4	London, S.W.—Pipe-laying	Waterworks Co.	T. & C. Hawkeley, C.E., 30 Great George Street, Westminster, S.W.
" 4	Rothwell—Reservoir	Urban District Council	F. W. Richardson, Rothwell, near Leeds.
" 4	Dublin—Motor-cars	Great Northern Railway Co.	T. Morrison, Secretary, Amiens Street Terminus, Dublin.
" 5	Widnes—Pumping-engine	Corporation	I. Carr, Engineer, Widnes.
" 5	Willesden—Sluice Gates	District Council	Engineer, Willesden Public Offices, Dyne Road, Kilburn, N.W.
" 7	Southgate—Bridge Works	County Council	H. S. Wakelam, County Engineer, Middlesex Guildhall, S.W.
" 7	Bristol—Fender Chains	Docks Committee	W. W. Squire, Engineer, Cumberland Road, Bristol.
" 8	Cwmbach and Five Roads—Sinking Wells	Education Committee	W. D. Jenkins, County Architect, Shirehall, Carmarthen.
" 11	Basingstoke—Pumping Machinery	Corporation	F. Reginald Phipps, Waterworks Engineer, Town Hall, Basingstoke.
" 12	Newcastle-upon-Tyne—Culvert	Corporation	City Engineer's Office, Town Hall, Newcastle-upon-Tyne.
1906.			
Jan. 9	Auckland—Wharf, &c.	Harbour Board	W. & A. McArthur, 150 Leadenhall Street, London, E.C.
May 1	Talcahuano, Chili—Dock		Direccion de Material, Valparaiso.
No date	Congleton—Waterworks	Rural District Council	W. Wyatt, Engineer, 99 Rodford Road, Leamington.
IRON AND STEEL:			
Dec. 2	Leicester—Pipes, &c.	Gas Committee	A. Colson, Engineer and Manager, Millstone Lane, Leicester.
" 5	London, S.W.—Fire Hydrants	County Council	Clerk of the Council, County Hall, Spring Gardens, S.W.
PAINTING AND PLUMBING:			
Nov. 30	Edinburgh—Re-painting of Offices	Parish Council	R. M. Cameron, Architect, 53, Great King Street, Edinburgh.
Dec. 4	Carlisle—Painting	Corporation	Henry C. Marks, City Engineer, 36 Fisher Street, Carlisle.
" 11	Birkenhead—Painting	Corporation	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
" 12	Crossness—Painting	London County Council	Maurice Fitzmaurice, Chief Engineer, County Hall, Spring Gardens.
ROADS AND CARTAGE:			
Nov. 30	Longton—Paving	Town Council	J. W. Wardle, Borough Surveyor, Court House, Longton.
Dec. 2	Willesborough—Cemetery Extension Works	Parish Council	F. H. Wilde, Surveyor, Willesborough.
" 4	Perth—Causewaying	Town Council	R. M'Killop, Borough Surveyor, Tay Street, Perth.
" 5	Woodford—Making-up	Urban District Council	W. Farrington, Surveyor, Council Offices, Woodford Green.
" 6	Fulham—Making-up	Borough Council	F. Wood, Surveyor, Town Hall, Fulham.
" 8	Brynamman and Cwmbach—Paving, Metalling, &c.	Education Committee	W. D. Jenkins, Education Architect, Shirehall, Carmarthen.
" 15	Maidstone—Materials	County Council	County Surveyor, Maidstone, Kent.
SANITARY:			
Nov. 30	Hanley—Sewage-disposal Works	Corporation	Willcox & Raikes, Union Chambers, Temple Row, Birmingham.
" 30	Instow—Relaying Sewer	Rural District Council	Arnold Thorne, The Square, Barnstaple.
" 30	Leytonstone—Sewers	Trustees	G. Midgley Taylor, C.E., 27 Great George Street, S.W.
Dec. 2	West Malling—Scavenging, &c.	Rural District Council	C. Souer, Inspector of Nuisances, West Malling, Kent.
" 5	Ulverston—Sewerage Works	Rural District Council	Engineer, Town Hall, Ulverston.
" 6	Bovey Tracey—Sewerage	Rural District Council	Bresley, Son & Nichols, Engineers, 11 Victoria St., Westminster, S.W.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.*	DEPOSIT REQUIRED FOR CONDITIONS, &c.*	FROM WHOM PARTICULARS MAY BE OBTAINED.
1906.				
Jan. 15	Hackney—Library	50, 30 and 20 guineas	£100.	W. A. Williams, Town Clerk, Town Hall, Hackney.

* Where a dash is given it does not necessarily mean that no premiums are offered and no deposit is required, but that we have not been informed what these are (if any).

A STEELWORK REFERENCE BOOK.

UNDER this heading we review the new catalogue just issued by Messrs. Redpath, Brown & Co., Ltd., because it is far different to the usual trade catalogue, being more of a reference book: it would indeed be useful to students, though designed more particularly for the use of architects and contractors. The book treats of girders and stanchions. Both of the parts dealing with these are introduced by short general discussions on the points to be observed in practice, and the methods of calculating the section required for a given stress. This is followed by a series of tables printed with black figures divided by lines in red so as to make reference easy. The book is compiled after the British standard sections, and therefore will be appreciated at the present moment, in view of the fact that most of the catalogues in circulation were drawn up before the issue of the specification by the committee. The tables of strength for beams are based on the maximum fibre stress of $7\frac{1}{2}$ tons per sq. in., which is a factor of safety of 4, the usual strength of steel being found to be 30 tons per sq. in. when tested. Messrs. Redpath, Brown & Co. are specially to be commended in this respect because many other manufacturers base their tables upon a factor of safety of 3, giving a fibre stress of $10\frac{3}{4}$ tons per sq. in., which is not safe in practice: in fact, this firm has spared no pains to make everything thoroughly clear, and there is no suggestion of deceiving the profession. The tables for the strength of stanchions are also compiled on the basis of a factor of safety of 4. In connection with each division of the book there are also included practical notes, such as upon the deflection in girders when the span exceeds twenty-two times the depth of the girder, upon side yielding when the length exceeds twenty times the width of the flange and is unbraced, and upon the connections between joists parallel and at right angles, rivets, &c. In the same way in regard to stanchions practical notes are included on bases, caps, brackets, foundations, &c. We think this portion of the subject could have been improved by including information upon the eccentric loading of stanchions and the forms most suitable for connection on the job, and forms most economical in manufacture. Very often sections are used which cannot be properly riveted in the shops, and others which are not convenient for erection on a job and render field riveting difficult and inefficient. Again, the suggested grillage foundation illustrated is not quite the best practice, although we know it has been adopted in many cases. The joists should be separated by cast-iron separators or held by plates riveted over them.

The book concludes with a series of very useful tables of sectional areas, moments of inertia, standard spacing for holes, standard connecting clips for joists, weights of floors and materials, live loads, fireproofing, powers, logarithms, reciprocals, circumferences and circular areas, natural sines, &c.; trigonometrical data, British and metric equivalents, &c., and a number of diagrams and fine views of the firm's various large works in London, Edinburgh, Manchester and Glasgow. The company's works are equipped with the most modern plant for constructional work; and large stocks of British standard sections, in accordance with the recommendations of the Engineering Standards Committee, have been laid down. The new works at East Greenwich have only been in operation for about eighteen months, but during that time several important contracts have been carried out for work in London and abroad.

"Handbook of Constructional Steelwork." Edinburgh: Redpath, Brown & Co., 2, St. Andrew Square. London: Riverside Works, East Greenwich, S.E.

Trade and Craft.**A Roofing and Walling Material.**

A new catalogue has just been issued by the British Uralite Co., Ltd., of 50, Cannon Street, London. This is a very sensible one, succinctly giving the chief claims for "Uralite," practical notes on how to use it, with weights for the different sizes of slabs and slates made of this material, and well-reproduced illustrations of buildings executed with it. Manufacturers too often provide little useful practical information, preferring to reprint laudations on their goods often in ungrammatical and coarse language with sheaves of testimonials (if they are so fortunate as to possess them). We are glad to see this firm setting a good example. Its catalogue is just of the right kind. It may be mentioned that while "Uralite" is extremely light it has both stiffness and great fire-resistance, so much so that it can be insured at the minimum premium.

Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.K.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending November 24th twenty-one failures in the building and timber trades in England and Wales were gazetted.

J. A. PAPE, plumber, Workington. R.O. Nov. 13th.

G. BROCK, builder, Longstock. Adj. Nov. 13th.

J. W. COLLINS, builder, Portsmouth. R.O. Nov. 17th.

J. FLOWITT, builder, Doncaster. R.O. Nov. 13th.

J. W. SMALLWOOD, painter and decorator, Todmorden. R.O. Nov. 14th.

C. FIELDING, builder and contractor, Glossop. De-ficiency £609.

W. SMITH, builder and contractor, Farnborough (late Blackwater and Ilford). Adj. Nov. 14th.

A. G. DEANE, builder and decorator, Reading. First meeting, Queen's Hotel, Reading, Nov. 30th, at 1. P.E., Assize Courts, Reading, Nov. 30th, at 3.

H. PRESSLER, plumber and decorator, &c., Chorley. First meeting, 19, Exchange Street, Bolton, Nov. 29th, at 3. P.E., Bolton C.C., Dec. 13th, at 3.

S. MASON, builder and contractor, Streethouse, Pontefract. First meeting, O.R.'s, Wakefield, Nov. 29th, at 11. P.E., Wakefield C.C., Dec. 7th, at 11.

R. M. MOSS, builder, Doncaster. First meeting, O.R.'s, Sheffield, Nov. 30th, at 12.30. P.E., Sheffield C.C., Nov. 30th, at 2.

JONES & CATHALL, plumbers, &c., Wrexham. First meeting, Crypt Chambers, Chester, Nov. 29th, at 12. P.E., Wrexham Town Hall, Dec. 12th, at 12.

H. T. ROBERTS, architect, Rhyl. First meeting, Crypt Chambers, Chester, Nov. 29th, at 3.15. P.E., Magistrates' Room, Bangor, Dec. 7th, at 12.30.

Coming Events.**Wednesday, November 29.**

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. T. Haddon on "A Practical Demonstration of Wrought-iron Work," at 8 p.m.

Friday, December 1.

ARCHITECTURAL ASSOCIATION.—Mr. E. F. Reynolds on "Turkish Architecture," at 7.30 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. J. Starkie Gardner on "Metal Applied as External Decoration to Buildings," at 6.45 p.m.

Saturday, December 2.

INCORPORATED BRITISH INSTITUTE OF CERTIFIED CARPENTERS.—Annual General Meeting, Carpenters' Hall, London Wall, at 6.15 p.m.

Monday, December 4.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. E. A. Rickards on "Intention in Ornament."

Tuesday, December 5.

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. J. H. Gibbons on "Some Hints on the Sketching of Churches," at 6.30 p.m.

SOCIETY OF DESIGNERS.—Mr. Fred Roe on "The Decoration and Construction of Medieval Coasters and Cupboards," R.B.A. Galleries, at 8 p.m.

Tuesday, December 6.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. E. Macrae on "A Tour in Belgium," at 8 p.m.

Friday, December 8.

JUNIOR INSTITUTION OF ENGINEERS.—Annual Dinner.

ARCHITECTURAL ASSOCIATION.—President's "At Home" at 8.30 p.m.

Saturday, December 9.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—General Meeting at 2 p.m.

Monday, December 11.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 4 p.m.

Tuesday, December 12.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Lecture by Mr. T. Baird at 8 p.m.

Wednesday, December 13.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. T. Preston on "Italian Art and Travel," at 7.30 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. L. G. Mouchel on "Ferro-concrete Construction," at 8 p.m.

Friday, December 15.

INSTITUTION OF MECHANICAL ENGINEERS.—Meeting at 8 p.m.

New Companies.

HUMIDINE, LTD., to adopt an agreement with W. Mole, F. E. Dunnett, G. H. Nelson and F. E. Nelson, and to carry on the business of manufacturers and vendors of Humidine and other paints, &c. Capital: £10,000.

GWERNER SLATE QUARRIES CO., LTD., to take over the business of slate quarry owners, slate merchants and the like, carried on by T. Edwards, E. Roberts, J. Griffiths and W. Bowler at Nantlle, Carnarvon. Capital: £8,000.

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FANLIGHT OPENERS & GEARING.

Metal Sashes.

Panic Bolts.

Weather Bars.

**Reversible
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Fittings, &c.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT'S ASSISTANT disengaged; 13 years' provincial experience. Design, working drawings, details, quantities, and supervision of works.—Box 1520, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT seeks SITUATION, age 21. Five years pupil of well-known London architect. Has designed and carried out over £1,000 of building work on own responsibility. Excellent references. Salary, 28s.—A. B., 82, Grosvenor Street, W. 1501

ARCHITECT'S ASSISTANT (nearly 22); over 5 years' London experience; student R.I.B.A.; design, working drawings, surveying, specifications, perspectives, correspondence, and general routine; salary moderate.—M., 7, Goulton Road, N.E. 1507

ARCHITECT'S ASSISTANT desires engagement in a London firm of Architects; good draughtsman, 6 years' experience and good references. Design, working and detail drawings, perspectives, &c. Moderate salary.—Apply E. O. N., 98, Elspeth Road, Clapham, S.W. 1518

ARCHITECTURAL DRAUGHTSMAN, 12 years' London and Provincial experience, requires engagement (28). Designs, working and detail drawings, specifications, perspectives, surveys and general routine, excellent references from leading firms. Salary 24 guineas.—HOOKWAY, 36, Juer Street, Battersea Park, S.W. 1516

ARCHITECT and SURVEYOR'S JUNIOR desires EMPLOYMENT; 3½ years' experience, surveying, levelling, &c.; neat draughtsman; also 7 months' with electrical firm; good references.—SPURGEON, Havant. 1497

ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT (23), seeks situation. London experience; good draughtsman, detail and small scale drawings; five years' general experience; good references; moderate salary.—B. A. E., "Glebeside," Preston Park, Brighton. 1512

ARCHITECT and ENGINEER'S ASSISTANT, age 26, desires ENGAGEMENT; 11 yrs. exp.; good draughtsman, surveying, levelling, quantities, supervision of works. Salary, £3.—RICHARD P. BLAKEY, 4, Zion Terrace, Sunderland. 1493

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CLERK OF WORKS desires EMPLOYMENT. Many years Government Service. Any district, but Essex preferred; good references.—W. LUMSDEN, "Woodside," Scutthamster. 1459

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PLUMBER, reliable, wants JOB. Well up in sanitary work and lead-laying; wages moderate, or would take piece-work, labour and solder only; good reference; age 31.—A. SMITH, 7, Ludwick Road, New Cross, S.E. 1457

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REPRESENTATIVE WANTED, who thoroughly understands the best class of Metal work and Electric Light Fittings. Must have good connection with the leading Architects and Electrical houses. This is an exceptional opportunity for a suitable man.—Apply, stating age, district, experience, and terms, to J. W. SINGER & SONS, Frome.

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Can you Design your own Steelwork? Do you know how to properly proportion your columns, stanchions, and girders? We guarantee to teach you how to do this in a few lessons by our System of Correspondence Tuition in Architectural Steelwork.—Apply to us for free Booklet J (4th edition), MIDLAND ENGINEERING BUREAU, STRAND, DERBY.

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THE ARCHITECTURAL ASSOCIATION.

December 1st. Ordinary General Meeting at 18, Tufton Street, Westminster, S.W., at 7.30 p.m. Paper by Mr. E. F. Reynolds on "Turkish Architecture" (illustrated with lantern views).

December 8th. President's "At Home," 18, Tufton Street, at 8.30 p.m. Exhibition of Sketches, &c.

HENRY TANNER, JR., { Hon. Secs.
A. MAYON WATSON, }

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- 1516.—ARCHITECT'S ASSISTANT; 12 yrs. Lond. and Prov. exp.; age 28; designs, wkg. drawings, details, specifications, perspectives, surveys, ex. refs.; sal. 2½ guineas.
- 1517.—ASSISTANT, A.R.S.I. (26); contract and detail drawings, specifications, land surveys, levelling and supervision.
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- 1521.—GENERAL or WORKING FOREMAN JOINER; plans, working drawings; good refs.; life abstanter.

See p. xx for the Employment Register.

Notice to Advertisers.

"We wish to say that our advertisement in your valuable paper has brought us a large number of new customers and still increasing. We have now opened a Railway Depot to deal with the Stone trade."

The above is an extract from a letter received on Monday morning last from a firm who have regularly advertised in the "Builders' Journal" for the past two years, and which proves in unmistakable fashion the unequalled value of this Journal to Advertisers.

Contracts Open.

BOROUGH OF FULHAM.

The Council of the above Borough is prepared, at its Meeting to be held on WEDNESDAY, the 6th day of DECEMBER, 1905, at 7 p.m., to receive TENDERS for MAKING-UP the CARRIAGE-WAY of Finlay Street, Fulham.

Plans and Specifications of the works may be seen, and any information obtained, from Mr. FRANCIS WOOD, A.M.I.C.E., F.G.S., Borough Surveyor, at his office, Town Hall, Fulham, S.W.

The Contractors are to attend personally, or be represented at the Council Meeting, to deliver their own Tenders, together with a £0 note and a Schedule of Prices, upon which the value of any extras or omissions shall be based, and to make a declaration that they pay the trade union rate of wages, observe such hours of labour as are generally accepted as fair in their trade, and that all unskilled labour shall be paid the minimum wage of 7d. per hour.

The Council does not pledge itself to accept the lowest or any Tender.

Town Hall, Fulham. R. M. PRESCOTT, Town Clerk.

TOTTENHAM EDUCATION COMMITTEE.

TENDERS are hereby invited for the ERECTION of a SCHOOL to accommodate 1,200 children on the Parkhurst Road Site, Tottenham.

Applications for quantities to be made to the Architect, Mr. G. E. T. LAURENCE, A.R.I.B.A., 22, Buckingham Street, Adelphi, W.C., on or before the 9th DECEMBER next, after which date plans and specifications may be seen at his office.

The sum of two guineas will be charged for the quantities, which sum will be returned on receipt of a bona fide Tender, accompanied by the conditions and priced quantities, otherwise the deposit will be forfeited.

The priced quantities will be returned to the unsuccessful firms.

Persons Tendering will be required to deposit with the CLERK, when handing in their Tenders, in Bank of England notes or cash, the sum of ten pounds, which will be forfeited by the person whose Tender is accepted if the Contract be not executed within seven days from the date he is informed it is ready for signature.

This deposit will be repaid to the parties Tendering who are unsuccessful.

The Contractor will be required to pay all workmen on the Committee's work the recognised trade union rate of wages.

The Committee do not bind themselves to accept the lowest or any Tender.

Signed W. MALLINSON,
Clerk to the Committee.
Education Committee Offices,
Philip Lane,
South Tottenham,
22nd November, 1905.

To Contributors.

THE EDITOR will be pleased to consider any articles illustrated or otherwise, dealing with old and new buildings, methods of construction, or other matter of an architectural character. He will also be glad to consider architectural photographs and sketches (the latter preferably in black and white) and measured drawings of work in this country or abroad. News items of interest to architects and builders will also be considered, provided the name and address of the sender are given; no notice will be taken of anonymous contributions. All communications should be addressed to the Editor of THE BUILDERS' JOURNAL, 6, Great New Street, E.C.

THE VALUE OF OUR EMPLOYMENT REGISTER.

THIS REGISTER was commenced as a serious endeavour on our part to meet a need that is continually felt both by EMPLOYERS and EMPLOYED, and we are pleased at the practical appreciation that has been shown by our readers since THE REGISTER was first started.

Nothing is more trying than to be out of employment, but the difficulty of the position is terribly augmented when money has constantly to be paid for advertisements in order to find other occupation.

On the other hand an Employer who has just obtained an important contract most likely needs you; and has a post to fill that you are wanting, but neither of you can find each other.

THE REGISTER serves this purpose and so meets both cases. For those wanting employment it is an inexpensive means of keeping their names and qualifications before the right people, and for the Employer it is a ready means of finding just the man he wants, without delay.

We are encouraged to find how largely our columns have been instrumental in meeting the requirements of both parties in the manner indicated above, and we thank those advertisers who have written expressing their pleasure and indebtedness to THE REGISTER.

Many have found it an invaluable aid in getting appointments, and we would urge all those who are out of work, or want to change their situations, in fact, all who have a "want," to make use of these columns and thus make THE REGISTER a record of still more value to Employers and Employed.

For 3s. we give 3 insertions (four lines), in our "Appts. Wanted" Columns, and also 6 insertions in the "EMPLOYMENT REGISTER" (see page xx).

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE, E.C.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans ...	per qr.	1	10	0	1	13	0
Clover, best ...	per load	3	12	0	4	0	0
Hay, good ...	do.	3	5	0	3	10	0
Sainfoin mixture ...	do.	3	7	0	3	15	0
Straw ...	do.	1	8	0	1	14	0

OILS AND PAINTS.

Castor Oil, French ...	per cwt.	1	10	0	1	2	15
Colza Oil, English ...	do.	1	4	9	—	—	—
Copperas ...	per ton	2	0	0	—	—	—
Lard Oil ...	per cwt.	2	15	0	2	17	0
Lead, white, ground, carbonate ...	per ton	16	0	0	—	—	—
Do. red ...	do.	15	0	0	0	19	0
Linseed Oil, barrels ...	per cwt.	0	17	10	—	—	—
Petroleum, American ...	per gal.	0	0	7	0	0	7
Do. Russian ...	do.	0	0	6	0	0	7
Pitch ...	per barrel	0	8	0	—	—	—
Shellac, orange ...	per cwt.	9	2	6	—	—	—
Soda, crystals ...	per ton	3	2	6	3	5	0
Tallow, Town ...	per cwt.	1	6	9	1	7	6
Tar, Stockholm ...	per barrel	1	5	0	—	—	—
Turpentine ...	per cwt.	2	4	6	—	—	—

METALS.

Copper, sheet, strong ...	per ton	89	0	0	—	—	—
Iron, Staffs., bar ...	do.	7	0	0	8	10	0
Do. Galvanized Corrugated sheet ...	do.	12	0	0	12	5	0
Lead, pig, Soft Foreign ...	do.	15	10	0	—	—	—
Do. do. English common brands ...	do.	15	15	0	—	—	—
Do. sheet English, 3lb. per sq. ft. and upwards ...	do.	17	0	0	—	—	—
Do. pipe ...	do.	17	10	0	—	—	—
Nails, cut clasp, 3in. to 6in. ...	do.	9	5	0	—	—	—
Do. floor brads ...	do.	9	0	0	—	—	—
Steel, Staffs., Girders and Angles ...	do.	6	15	0	7	5	0
Do. do. Mild bars ...	do.	7	5	0	7	10	0
Tin, Foreign ...	do.	154	0	0	154	10	0
Do. English ingots ...	do.	156	0	0	158	0	0
Zinc, sheets, Silesian ...	do.	31	7	6	—	—	—
Do. do. Vienne Montaigne ...	do.	31	10	0	—	—	—
Do. Spelter ...	do.	28	12	6	28	15	0

TIMBER.

SOFT WOODS.

Fir, Dantzic and Memel ...	per load	2	15	0	5	0	0
Pine, Quebec, Yellow ...	do.	4	2	6	7	10	0
Do. Pitch, American ...	do.	3	1	0	5	0	0
Laths, log, Dantzic ...	per cu. fath.	4	0	0	6	0	0
Deals, St. Petersburg, Yellow, 1st, 3x11 ...	per std.	16	5	0	—	—	—
Do. do. do. do. 3x10 ...	do.	8	10	0	—	—	—
Do. do. do. do. 3x9 ...	do.	13	5	0	13	10	0
Do. do. do. do. 3x9 ...	do.	11	0	0	—	—	—
Do. do. do. do. 2½x7 ...	do.	11	0	0	11	5	0
Do. do. do. 3rd, 3x11 ...	do.	8	5	0	—	—	—
Do. do. do. do. 3x9 ...	do.	8	0	0	—	—	—
Do. do. do. do. 2½x7 ...	do.	8	0	0	—	—	—
Do. do. White, 3rd, 3x9 ...	do.	8	10	0	—	—	—
Do. do. do. do. 3x7 ...	do.	7	15	0	—	—	—
Do. Quebec, Spruce, 2nd, 3x9 ...	do.	9	10	0	—	—	—
Do. Soderhamn, Yellow, 3rd, 3x9 ...	do.	12	5	0	—	—	—
Do. do. do. Unsorted, 3x4½ ...	do.	9	10	0	—	—	—
Do. Räfsö, Yellow, 1st, 3x9 ...	do.	14	5	0	—	—	—
Do. do. do. 2nd, 3x9 ...	do.	12	5	0	—	—	—
Do. do. do. 4th, 3x7 ...	do.	8	10	0	—	—	—
Do. do. do. 4th, 3x4 ...	do.	8	0	0	—	—	—
Do. Skelleftea, Yellow, 2nd, 2½x7 ...	do.	9	0	0	—	—	—
Do. Matane, Spruce, Unsorted, 3x9 ...	do.	9	5	0	—	—	—
Do. Petschora, Yellow, 3rd, 3x9 ...	do.	10	0	0	—	—	—
Do. Fingerhakenholmen, Yellow, Unsorted, 3x7 ...	do.	8	15	0	—	—	—
Do. Raumo, Yellow, Unsorted, 3x4½ ...	do.	7	15	0	—	—	—
Do. do. do. do. 3x4 ...	do.	8	5	0	—	—	—
Do. Pernoviken, Yellow, 1st & 2nd, 2½x8 ...	do.	8	10	0	—	—	—
Do. do. do. do. 2½x7 ...	do.	9	0	0	—	—	—
Battens, all kinds ...	do.	6	15	0	13	0	0
Flooring Boards in, prepared, 1st ...	per square	0	9	3	0	14	0
Do. 2nd ...	do.	0	8	3	0	9	9
Do. 3rd, &c. ...	do.	0	7	3	0	8	0

HARD WOODS.

Ash, Quebec ...	per load	3	15	0	7	10	0
Birch, New Brunswick ...	do.	2	5	0	4	10	0
Do. Quebec do. ...	do.	2	10	0	4	15	0
Box, Turkey ...	per ton	7	0	0	20	0	0
Cedar, Cuba ...	per ft. sup.	0	0	3	0	0	4
Do. Honduras ...	do.	0	0	6	—	—	—
Do. Tobasco ...	do.	0	0	5	—	—	—
Elm, Quebec ...	per load	4	0	0	8	5	0
Jarrah, plank ...	per ft. cu.	0	2	6	0	3	0
Mahogany, Average Price for Cargo, Honduras ...	per ft. sup.	0	0	4	2	3	0
Do. Tobasco ...	do.	0	0	3	0	0	6
Do. Cuba ...	do.	0	0	3	—	—	—
Do. African ...	do.	0	0	3	—	—	—
Oak, Wainscot ...	per log.	3	10	0	7	5	0
Teak, Indian, logs ...	per load	9	5	0	19	0	0
Do. do. planks ...	do.	12	15	0	20	0	0
Whitewood, American, logs ...	per ft. cu.	0	1	3	0	1	6
Do. do. planks and boards ...	do.	0	1	3	0	3	0

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberdeen.—Accepted for engineering shop and additions to company's bakery in Berryden Road, for the Northern Co-operative Co. Mr. R. G. Wilson, 181A, Union Street, Aberdeen:—

Mason—G. Hall.
Carpenter—Leslie & Hay.
Plumber—J. Matthews & Son.
Plasterer—J. Scott & Son.
Slater—A. Adam & Co.
Painter—A. Adam.
Ironworker—Abernethy & Co.
Road-maker—J. Leith, junr.

[Total, £3,764 1s. 1d.] [All of Aberdeen.]

Ely.—For the erection at March of a block of elementary schools to accommodate 600 boys and girls, for the Isle of Ely Education Committee. Mr. R. S. W. Perkins, county surveyor, Common Road, Ely:—

A. Christmas, March ...	£9,500	0	0
C. Redhead, March ...	7,395	0	0
H. Papworth, March ...	7,350	0	0
Kerridge & Shaw, Cambridge ...	7,295	0	0
H. J. Linzell, Newmarket ...	7,187	0	0
A. Bateman, Ramsey ...	7,187	0	0
A. Neuss & Son, Cambridge ...	7,090	0	0
O. P. Drever, Kettering ...	7,017	17	0
Grimwood & Sons, Ipswich ...	6,883	0	0
J. G. Cowell, Soham ...	6,800	0	0
C. Roper, Ipswich ...	6,800	0	0
W. E. Champion, Woolwich ...	6,704	0	0
H. Feast, Haddenham ...	6,649	10	0
Oak Building Co., Cambridge ...	6,590	0	0
Thackray & Co., Huntingdon ...	6,500	0	0
W. Howard, Huntingdon ...	6,499	0	0
Page & Son, Buckden, Hunts ...	6,499	0	0
Coulson & Loftus, Cambridge ...	6,419	0	0
Parrey & Son, Earith, Hunts ...	6,335	0	0
Rands & Sons, Wisbech ...	6,300	0	0
R. Shanks, Chatteris ...	6,190	0	0
Clark & Son, Cambridge ...	6,125	0	0
Kettering Co-operative Builders ...	5,905	0	0
G. W. Heath, March ...	5,671	0	0

* Accepted subject to the sanction of the Local Government Board to the necessary loan.

Hindley.—Accepted for the erection of a new elementary school in Argyle Street, for the Urban District Council. Mr. Herbert Wade, architect, 27, Birley Street, Blackpool:—

D. A. Ablett, Sovereign Road Sawmills, Wigan ...	£8,850	0	0
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NOTE.—Lowest tender; seventeen tenders in all.

Milton Ernest.—For the erection of a residence for Mr. H. Curtis. Mr. H. Young, architect, Bedford:—

W. T. Sharpe & Son ...	£5,449	0	0
W. Packwood ...	5,361	0	0
A. J. Dawes ...	5,318	0	0
S. Foster ...	5,297	0	0
C. E. Rayes ...	5,277	0	0
J. R. White ...	5,195	0	0
C. E. Haynes ...	4,995	0	0
R. Marriott ...	4,885	0	0
E. Brown & Son ...	4,800	0	0
Warton & Dunstall ...	4,715	0	0
R. Jeakings ...	4,517	0	0

* Accepted.

Niton.—Accepted for the erection of a Council school, for the Isle of Wight Education Committee:—

A. Sims, Ventnor ...	£1,840	0	0
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Northampton.—Accepted for the erection of a new laundry at Berry Wood Asylum:—

R. Cosford, Connaught Street ...	£6,322	0	0
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Pentney.—For the erection of a proposed new school, for the Norfolk Education Committee. Mr. Edwin J. Tench, architect, A.R.I.B.A., 14, Upper King Street, Norwich:—

	School.	Addition, for screen.
Read & Wildbur, King's Lynn ...	£1,260	0
H. Blyth, Foulsham ...	1,215	0
Coulson & Loftus, Cambridge ...	1,214	0
J. Needs, Fakenham ...	1,195	0
R. Dye, King's Lynn ...	1,198	0
Oak Building Co., Cambridge ...	1,199	0
R. Shanks, Chatteris ...	1,188	0
Tash, Langley & Co., King's Lynn ...	1,165	7
A. D. Boddy & Sons, Norwich ...	1,160	0
Podd & Fisher, Norwich ...	1,120	0
Clark & Sons, Cambridge ...	1,110	0
J. Medwell, King's Lynn ...	1,098	10
S. Hipwell & Co., Wisbech ...	1,090	0
Gunton & Palmer, Costessey ...	1,050	0
A. C. Taylor, Norwich ...	1,043	0
A. S. Lincoln, Norwich ...	1,039	0
G. Jeffries, Swaffham ...	1,037	0
A. W. Barnes & Co., King's Lynn ...	980	0

[Architect's estimate, £1,070.] * Accepted.

Swindon.—Accepted for the erection of eighteen houses at Bruce Street, Rodborne Road, for Mr. S. Bruce Morrison. Messrs. Drew & Sons, architects, Regent Circus, Swindon. Quantities by the architects:—

Tydemans Brothers, Swindon ...	£3,330	0	0
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(Continued on p. xviii.)

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TENDERS—cont. from p. xvi.

Mile End.—For the provision of a school for mentally defective children and also of manual training and domestic economy centres, for the L.C.C.:

Staines & Son, Great Eastern Street	£5,792	0	0
W. Harris, North Woolwich	5,662	0	0
Perry & Co., Bow	5,323	0	0
J. Grover & Son, New North Road	5,133	0	0
J. Greenwood, Ltd., London Bridge	4,662	0	0
A. E. Symes, Stratford	4,605	0	0
W. Lawrence & Son, Waltham Cross	4,487	0	0
J. Shelbourne & Co., *70, Fenchurch Street	4,434	2	11

* Recommended. [Architect's estimate, £5,250.]

Thornton Hough (Cheshire).—Accepted for the erection of a new church, for Mr. W. H. Lever, Mr. James L. Simpson, architect, Liverpool:

Design selected in limited competition.
Messrs. Smith Brothers (Burnley) Ltd.

West Acton, W.—For the erection of the first portion of St. Martin's Church. Messrs. Edward Monson & Sons, architects, of Grosvenor House, Acton Vale, W., and 22, Buckingham Street, Adelphi, W.C.:

Pattinson & Sons, Westminster, S.W.	£10,353
Dove Brothers, Islington, N.	10,195
Goddard & Sons, Farnham	9,999
Godson & Sons, Kilburn, N.W.	9,879
Willcock & Co., Wolverhampton	9,649
Galbraith Brothers, Camberwell, S.E.	9,499
Dorey & Co., Ltd., *Brentford	9,332

* Accepted.

Westminster.—For the erection of the new buildings of the L.C.C. Westminster Technical Institute:

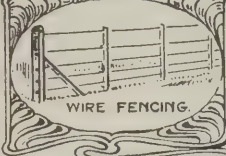
J. Barker & Co., Kensington	£25,680
S. E. Moss & Co., Southend-on-Sea	24,000
J. Shelbourne & Co., London, E.C.	23,977
Spencer, Santo & Co., Ltd., London, S.W.	23,700
J. C. Richards & Co., Croyley Road	23,589
Perry & Co., Bow, E.	23,586
J. Mowlem & Co., London, S.W.	23,519

Prestige & Co., London, S.W.	£23,175
Lawrence & Sons, London, E.C.	23,125
F. & T. Thorne, Isle of Dogs, E.	23,000
Leslie & Co., London, W.	22,977
W. Downs, London, S.E.	22,968
F. & H. F. Higgs, Loughborough Junction	22,948
Kirk & Randall, Woolwich	22,898
T. G. Sharphington, Nunhead	22,840
H. L. Holloway, Deptford	22,800
H. Lovatt, Ltd., Wolverhampton	22,758
Martin, Wells & Co., Ltd., Vauxhall	22,700
J. E. Johnson & Son, Westminster	22,673
W. Pattison & Sons, Ltd., London, S.W.	22,485
W. Lawrence & Son, Waltham Cross	22,478
Holloway Brothers (London), Ltd.	22,370
G. E. Wallis & Sons, Maidstone	22,341
W. Johnson & Co., Ltd., Wandsworth	22,282
B. E. Nightingale, Albert Embankment	22,237
Charles Wall, Ltd., Chelsea	21,979
F. G. Minter, Putney	21,975
Kerridge & Shaw, Cambridge	21,911
Waring-White Building Co., Ltd.	21,800
Garrett & Son, *17, Balham Hill	21,490
J. & M. Patrick, Wandsworth	21,090
A. Hudson & Co., Westminster	21,050


* Recommended. [Architect's estimate, £22,275.]

Wallasey.—For the erection and completion of the proposed new school at St. George's Road, for the Education Committee:


		Alternative tenders.
R. Allen	£17,296	£17,000
R. Constain & Sons	16,997	16,617
T. Cuthbert	16,970	16,441
S. Webster	16,646	16,000
J. Ellison	15,800	16,050
S. Butterworth & Sons	15,771	15,293
Hughes & Stirling	15,500	14,877
P. Tyson	15,490	15,250
J. Williams	15,200	14,600
J. Patterson & Co.	15,177	14,577
J. Gourley	15,035	14,216
B. Vickers & Son	15,000	14,440
P. Rothwell	14,985	14,493
J. Bellis	14,900	14,400
Holme & Greene	14,898	14,321
T. Spencer	14,878	14,500
J. Merritt	14,860	14,288
T. F. Cooke	14,828	14,475
F. W. Mayor & Co.	14,792	14,447
H. E. B. Greene & Co.	14,735	14,216
Dryland & Preston	14,597	14,025
W. Brown & Sons	14,500	14,290
W. Hall & Son	14,485	13,995
C. W. Davenport	14,449	14,232
Brown & Backhouse	14,433	14,212
J. Gerrard & Sons	14,356	13,195
W. H. Forde	14,337	13,830
Duthie & Dobson	14,247	14,677
J. H. Vickers	14,232	13,707
J. Mills & Son	14,200	13,654
J. Rothwell & Sons	13,995	13,980



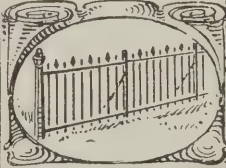
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THE

BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

December 6, 1905. Vol. 22, No. 565.

6, Great New Street, Fetter Lane, E.C.

Summary.

In Constantinople within little more than a hundred years seven great mosques were built by the Turks. Of these the Suleimaniyeh, the third mosque of Sultan Suleiman, in point of size and natural position dominates almost all the city. This mosque is 227ft. wide and 203ft. long, and with its forecourt makes up a length of 359ft. The diameter of the dome is 85ft. 4ins., as compared with 101ft. 8ins. of Santa Sophia. Another great mosque is that of Ahmed I., which is almost as big as the Suleimaniyeh, and especially noticeable for its six minarets. (Page 320.)

At Peterston, near Cardiff, a garden city, to be called "Coryville," is proposed to be laid out by Mr. John Cory. The plan is circular, with a green in the centre, from which avenues radiate. Each house will be allotted a good-sized piece of ground, and a scheme is being prepared by which 80 or 85 per cent. of the money for building the houses will be provided on security of the lease, thus enabling small holders to occupy their own houses. (Page 326.)

Professor Simpson is writing a history of architecture, to be published in three volumes. The first has just been published, and forms a serviceable introduction to the subject. (Page 327.)

In the competition for the proposed central library for Hackney the replies to competitors' questions are unsatisfactory, more especially in regard to the leading question as to the author of the first-premiated design being appointed to carry out the work. In an interview which a competitor had with the town clerk the latter said he had no reason to suppose that the council intended to adopt any but the usual course. This is satisfactory so far as it goes, but it is not sufficient. (Page 329.)

At Darlington last week a builder was fined £10 and costs for putting joists too far apart and laying concrete 2ins. thick instead of 6ins. (Page 332.)

Wren's house in Botolph Lane, Eastcheap, was put up for sale last week, but withdrawn, nothing higher than £6,750 being offered for it. (Page 329.)

The Birmingham City Council have decided to erect additional municipal offices and an extension of the art gallery, estimated to cost £150,000, and an open competition for designs is to be held. (Page 330.)

Architectural and Building Events of 1905.

WITH our issue for December 27th we shall publish an illustrated review of the building and architectural events of 1905, following the experiment of last year, which was so highly successful. The field covered by this review is naturally very extensive. By our ordinary news channels we are kept in touch with new buildings being erected or completed in every part of the kingdom, as well as abroad, but it is clearly impossible for us to be cognizant of everything that takes place. We therefore seek the aid of readers throughout the country, to whom we shall be grateful for a note of anything important which has been done or is contemplated in their several districts. Possibly the information may overlap that already in our possession, but, on the other hand, there may be some important work which has escaped our attention. The review is quite unique of its kind, and nothing on the same scale has been done before by any other journal, so far as architecture and building are concerned.

The Unemployed and the Building Trades.

EVERYBODY is now talking and thinking of the unemployed problem. It is opportune therefore to make a few remarks on the subject from the point of view of the building trades. In winter-time these trades are always slack, and consequently distress becomes more acute. The building trades are of course dependent upon the general trades for their work, and just now there is exceptional slackness due to several years of bad trade. It must not be forgotten that the building industry is the last to feel bad trade and the last to benefit by a revival, which may be a year or two behind that of the general trade of the country. It is satisfactory, however, to note that trade is now reviving, and as a consequence we may hope that soon the building industry will gain an impetus. But there are other aspects of the question which may be considered. It seems to be an accepted article of belief that it is foolish to enter upon building works during wintry weather. Frost, fogs and rain seem to be regarded as factors likely to increase the cost of or to prevent safe building. In colder climates, however, the building trades are carried on in winter, measures being taken to overcome the danger from frost at least; as one instance of this we may recall the

fact recorded by our Consul at Christiania that bricklaying is there executed in frosty weather by the use of unslaked lime. Portland cement, too, is not much affected by frost, and by using sacking or tarpaulins to cover walls the final remedy is secured. When ground is hard it cannot be excavated, but it seldom remains so for long. Intemperate weather is no doubt a deterrent on many works. In heavy rain a large number of men in the early stages of a building would necessarily be forced to stand down, but when a building is more advanced the floors and roofs often enable work in the interior to be carried on in wet weather. Fog chiefly causes delay by interfering with the delivery of materials, but storage on the site should overcome this. It is apparent that in the country especially men and carts and horses are to a large extent idle, not being employed upon the land, and thus cheap cartage of materials could be obtained. Somewhat in the same way the general slackness of trade may be reckoned to cheapen the cost of labour. We are afraid, however, that distress in the building trades is almost inevitably due to the law of supply and demand. Our education has unfortunately not been framed to deal with this factor, so that a man usually knows only one trade, while many are unskilled in any trade. After all, the building trade does not serve one of the fundamental necessities of living, and so it is essentially dependent upon those industries which do.

A Model Essay. STUDENTS ought to have their attention called to the paper on "Turkish Architecture" read last Friday before the Architectural Association by Mr. E. F. Reynolds. It is an excellent model to follow. The subject is an original one and embodies the result of personal research in a field practically unexplored, and it is interesting to observe how well the author has traced the development of the architecture from the constructive needs, and how he has compared and discussed the principles there employed and the results obtained. There are many opportunities for similar investigation in other countries, and students who have the chance (such as was afforded Mr. Reynolds by winning the Soane Medallion) to visit foreign lands would do well to follow his example.

TURKISH MOSQUES.

By E. F. REYNOLDS.

ON Friday evening at 18, Tufton Street, Westminster, Mr. E. F. Reynolds read an extremely interesting paper on "Turkish Architecture" before the Architectural Association (Mr. John Murray, vice-president, in the chair). The lecture was illustrated by a number of lantern slides and drawings. It is here illustrated by a selection of photographs of the chief mosques dealt with in the paper, with the exception of Santa Sophia, which has been omitted for the reason that it is, of course, not a Turkish mosque, and, moreover, it is so very well known to all students of architecture.

Difficulties.

Mr. Reynolds observed that the student of Turkish architecture was confronted by a somewhat unusual initial difficulty. He found that there were few authorities on the subject, that they gave but meagre information, and that much of the information was inaccurate and misleading. And even though the student proceeded to Turkey, he would find very little opportunity to study the buildings on the spot. Religious fanaticism and political suspicion had almost closed Turkish doors against the inquisitive architectural infidel, and only by the most exceptional good fortune might the right to enter, sketch and measure be obtained. Through the courtesy of the Royal Institute of British Architects and the British Embassy at Constantinople such good fortune was Mr. Reynolds's, so that, in company with Mr. J. B. Fulton, he was able to study the subject thoroughly.

The Mohammedan religion has been as powerfully represented in building as the Christian religion, and Turkish mosques represent the most impressive and a most characteristic phase of Turkish architecture. To this aspect of it Mr. Reynolds confined himself in the present paper, entirely disregarding the palaces, the castles, the bazaars and the domestic buildings which show other aspects of the same art. He confined himself, in fact, almost exclusively to the great mosques of Constantinople.

The following is a summary of his remarks.

Two Mosques at Brusa.

In approaching our subject we may take a preliminary glance at two mosques at Brusa, the Turkish capital in Asia Minor before the conquest of Constantinople. Ulu Jami, the Great Mosque, represents a type of plan derived from the original courtyard type, the rectangle of the building being divided by massive piers and arches into twenty square bays, each covered with a cupola set on pendentives, except one central bay, which remains open to the sky. The other mosque, Yeshil Jami, or the Green Mosque, was built in 1420, and represents a complex variety of the later cruciform type of plan, this complexity being due to the fact that the mosque was built on the site of a Byzantine church, and also because it was the royal mosque, and, therefore, included special chambers for the Sultan. The whole building is a storehouse of an early Turkish art full of Persian influence, and it realizes an effect of the utmost luxury and beauty.

These two mosques may be taken as typical of Turkish building prior to the conquest of Constantinople, differing from other Saracenic work of the time only as varieties of the main stock, closely related to the mosques of Egypt and Persia, and perfectly normal in development.

Santa Sophia.

With the conquest of Constantinople, however, the natural growth of Turkish mosque building was radically modified by a new influence—by that of a single building indeed—Santa Sophia. Rumours of the splendour of the church had long been current in the East,



THE MOSQUE OF BAYEZID.

and Mohammed himself had prophesied its conversion to a mosque. The Turks, therefore, regarded it as a predestined possession, and it may be that we owe its preservation to this view. But, not content with its possession, the Turks emulated its qualities, and henceforward they founded all their great mosques on its model, disregarding their own traditional forms or altering them in unison with their new ideal.

Characteristics of the Turk.

The change was probably less due to real aesthetic appreciation than to a desire to invest their own religion with an easily-adapted magnificence. The Turks were a military rather than an artistic race. They had little of the subtle instinct of the artist. To them art was a slave to minister to their pomp and luxury rather than a spirit to be sought with toil and glad self-sacrifice. A close parallel may, indeed, be drawn between the character of the Turk and the Roman, and the comparison is rendered more striking

by the similarity of experience in their contact with the art of another race. But whereas the Romans had adopted Greek forms for the decoration of their own structure, thereby stifling the expressive evolution of its true qualities, the Turks, on the other hand, adopted only the plan-type of Santa Sophia, leaving themselves free to adapt and develop it in accordance with their need, and to clothe it with fresh expression by a thoroughly Saracenic mode of decoration.

Requirements of Ritual.

The requirements of Mohammedan ritual are simpler than those of Christian ritual. The mosque proper is preceded by a forecourt, which gives additional space for the crowds of the faithful who assemble at the great festivals, and at the centre is placed a fountain of ablution. The mosque itself provides a sheltered place for prayer, and, so long as sufficient floor-space is provided its general shape may vary very considerably. A small niche in the centre of the eastern



THE MOSQUE OF SHAH-ZADEH.

wall indicates the direction of Mecca, but has no such ceremonial significance as the altar in the Christian church.

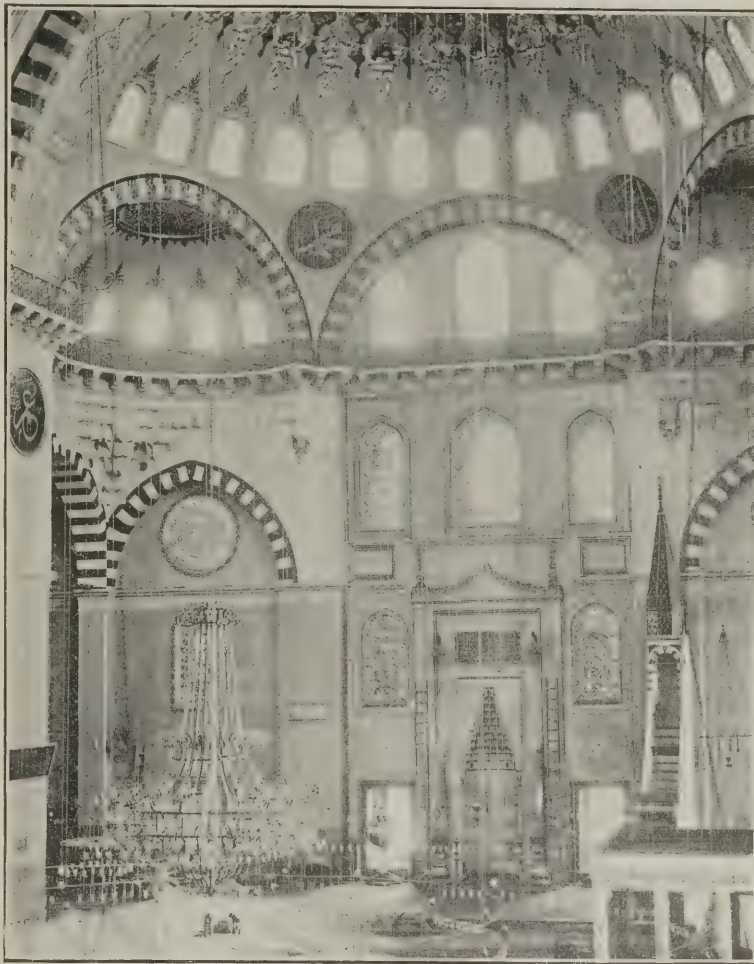
Applying these conditions to Santa Sophia, it is evident that, although simplification was necessary, yet in its main lines the plan was eminently suited to Mohammedan ritual. The broad unbroken space under the dome and semi-domes precisely fulfilled the conditions of Mohammedan worship, and it was this principle of covering a large area which was the main theme of the subsequent Turkish mosques. The aisles of Santa Sophia, necessary to give depth of abutment to the great arches of the dome, were also retained, but their subdivision in height by galleries was discontinued. These galleries had been reserved for the use of women in the Christian Church; but a Mohammedan controversy had decided that women have no souls, and their galleries were accordingly abolished in future mosques. The exedrae, or subsidiary apses, seem to have been regarded as obstructions to that broad floor-space which was the Mohammedan ideal, and the whole tendency of mosque construction was toward a great square described around four isolated piers which sustained the central dome.

The Great Era of Mosque Building.

The mosques were built on a grand scale, and the more powerful Sultans successively vied with each other in erecting a magnificent tribute to Allah and a convincing proof of their own power. Several of the mosques approach Santa Sophia in size, but perhaps more astonishing than their size is the sustained, yet concentrated, energy of their building. Within little more than a hundred years some seven great mosques were built in Constantinople which are definitely larger than the innumerable smaller mosques that fill the city, and any one of these alone would make the city notable.

The Mosque of Bayezid.

The first mosque to be built in Constantinople was erected by Mohammed the Conqueror himself; but it was destroyed by an earthquake and rebuilt at a later date, and no record of its original design remains. The earliest existing great mosque was built by Bayezid II. in 1497-1515. This is one of the smallest of the imperial mosques, the forecourt and mosque forming a double square on plan, which measures 268ft. by 135ft. The forecourt is surrounded by a cloister six bays square, each bay being defined by pointed arches set on columns and



INTERIOR OF THE SULEIMANIYEH.

covered with a cupola set on pendentives. The mosque itself is set out as an exact square, 120ft. gins. across internally, and the four central piers are so placed as to include two of the four equal bays of the aisles, these bays being covered with cupolas on pendentives. The dome is carried on pendentives which close round the great arches, and at the base it is pierced with a ring of windows after the manner of Santa Sophia.

But the crux of the whole design was the management of the semidomes. It has already been said that the Mohammedan architect seems to have felt the apses and exedrae of Santa Sophia to be obstructive, and he solved the difficulty by making them an affair of vaulting only.

In this case the semidomes of the exedrae are altogether omitted, and the great semidome is carried on simple pendentives, so that it is a repetition of half the central dome. This mosque is of special interest on account of an unusual development at the west end. The western aisle is extended on each side by additional wings, so that an uninterrupted vista, 272ft. in length, is obtained. Each wing is divided into three bays and covered with five cupolas, their supporting arches being carried on other arches in a most astonishing and characteristically Oriental way.

On the ground plan of all these mosques there is no sign of the complex domical forms which are so conspicuous externally, and the whole of them are ingeniously carried on arches.

The features of the exterior almost repeat the forms of the interior. The four great piers beneath the dome are marked by circular turrets, and the two minarets rise clear from the buildings below, a twin and slender contrast to the broad curved masses of the mosque.

The Mosque of Shah-Zadeh.

The next great mosque—that of Shah-Zadeh—was built by Sultan Suleiman I., the Magnificent, in 1543-48. It exhibits several changes which ultimately became embodied in the traditions of mosque-building. Its architect was an Armenian named Sinan, and he seems to have gathered together the vague tendencies of his day, stamping them with his personality and setting the standard



ENTRANCE TO THE SULEIMANIYEH.

which henceforward guided the design of Turkish mosques. He may well be compared with such a man as Bramante in Italy or Inigo Jones in England.

The Shah-Zadeh Mosque is of medium size, measuring 145ft. by 166ft., while the forecourt measures 133ft. by 117ft., giving a total length of 278ft. The forecourt is surrounded by a cloister of unusually large bays, each being 28ft. square; and the north and south arcades have deep wall-arches with projecting piers.

Three Innovations.

The mosque itself is set out in the exact form of a square, and there are three principal innovations to be noticed. The first is that the application of semidomes is no longer confined to the east and west sides of the central dome. All the four sides are treated exactly alike in this respect, and the expression of length given by the north and south arcades in the previous mosque, and reminiscent of the Christian Church, is exchanged for a more central and perhaps more logical emphasis of the great dome. Although, as compared with the Bayezid

and the greater height of the dome, and, with the Oriental dislike of projection, or in the desire of utilizing the whole extent of building, the spaces between the buttresses were filled with arcaded galleries. These were partly used as porticos, and they became a permanent feature in later mosques and an important factor in the external aspect of the façades.

The Suleimaniyeh.

In 1550 Sinan began the building of the third great mosque of Suleiman I., which is called the Suleimaniyeh after him, and which, in point of size and natural position, dominates almost all Constantinople. This mosque is 227ft. in width and 203ft. in length, and, with the forecourt, makes up a total length of 359ft. It is interesting to compare the size of this, the largest of the Turkish mosques, with the church of Santa Sophia, its prototype. The church is 237ft. wide and 291ft. long, its total length, including the original forecourt, being about 444ft. Thus, while appreciably smaller than the church, the mosque is, nevertheless, on a most magnificent scale. The diameter of the dome

Externally the grouping is less compact than in the previous mosques. The great arches beneath the dome had always been sustained by internal buttresses passing over the aisles, but here, probably on account of the great scale, they project above the roofs and add a further complication to the already complex formation of cupolas and domes. A novelty is introduced in the great pent-roof which projects over the external galleries (see preceding page). Its purpose is to shelter the faithful while performing their ablutions at the series of fountains below, and it was generally adopted afterwards. For the first time, also, four minarets were erected—two in their usual position at the junction of the mosque and forecourt, and the other two, of less height, at the western angles of the forecourt.

The Mosque of Ahmed.

The next great mosque was built by Ahmed I. in 1609-14, facing the ancient Hippodrome and close to Santa Sophia. In scale it is almost equal to the Suleiman Mosque, measuring 214ft. by 364ft.; and the forecourt is the largest in Constantinople,



GENERAL VIEW OF THE SULEIMANIYEH.

Mosque, the actual floor space is only increased by the omission of two columns, yet the æsthetic restriction of the north and south tympanum walls was removed, and the whole interior filled with a wonderful sense of expansion.

The second point of originality lay in the introduction of subsidiary semidomes in the bases of the great semidomes. The complete domical scheme of the apses of Santa Sophia was thus reproduced, although entirely supported on arches and not indicated in any way on the ground plan. A difficulty arises in fitting the curves of the lesser semidomes within the rectangular lines of the lower plan, and to this was probably due the simpler form of the earlier Bayezid Mosque. This difficulty was solved in the Shah-Zadeh Mosque by playing back the main piers so as to give room behind the great arches for the full development of the lesser semidomes, and some such device was generally adopted afterwards.

The third point of fresh development was the extension of buttresses on the north and south sides of the mosque. This was rendered necessary by the increased scale of building

is 85ft. 4ins. as compared with 101ft. 8ins. in Santa Sophia.

The mosque itself in some degree indicates a reversion to an earlier type, for only the east and west sides of the dome have semidomes applied to them, while the north and south sides are filled with arcades bearing tympanum walls. Mr. Reynolds said he could find no reason for this reversion in the mosque itself, and was inclined to surmise that some reactionary influence may have been brought to bear on the architect, Sinan, similar to that which compelled Wren to build St. Paul's Cathedral on the Gothic plan.

The arrangement of the dome and the east and west semidomes, with the lesser semidomes, is similar to that of the Mosque Shah-Zadeh. The north and south aisles under the dome are divided into three bays, and these are grouped in a novel and somewhat curious manner, the central bay being larger than the other two. This setting-out has the result of putting several of the arches out of centre with the cupolas which they carry, and the effect is not altogether satisfactory.

for its width includes the external galleries of the mosque. The mosque itself represents the highest development of Turkish planning, for not only are semidomes applied to all four sides of the central dome, and not only are subsidiary semidomes applied to all of them, but also in three cases the number of the lesser semidomes is three instead of the usual two. In previous mosques the third subsidiary semidome was represented merely by a wall-arch, but here the greater internal depth of the buttresses allows its full development; and further, this internal depth of abutment is articulated with piers and arches. Altogether, the mosque is covered with twenty domical forms, besides various barrel-vaults, and the interior is filled with the interest of their curving modulation up to the central dome. The four piers under the dome are gigantic fluted columns 18ft. in diameter, and built of masonry; but the circular form looks somewhat weak and lacking in rigidity, notwithstanding its enormous size. Another striking feature of the interior is the great number of windows; fifty are shown on the ground plan alone, but, together with those in the upper walls,

the cupolas and domes, there are over 300 windows in all to light this one vast chamber.

The exuberant expansion of design permeates the whole building, and not four, but six, minarets rise around the mosque, emphasizing and relieving its domed mass by their own slender height. There are few Moham-medan mosques with more than four minarets, and the erection of these six led to a charge against the Sultan of wishing to vie with the Holy Mosque at Mecca.

The Yeni Valideh Jami.

In 1615 a mosque was commenced by the wife of Ahmed I., and, remaining unfinished, was completed fifty years later. This mosque, the Yeni Valideh Jami, differs from other mosques in situation, for it is not raised on an eminence apart, but is built on the shore of the Golden Horn, and surrounded by the business of a market-place. Although of comparatively small size, its dimensions are still very respectable. The width of the mosque is 156ft., while the total length, including the forecourt, is 272ft. The fore-court is of the normal type, entered by three doorways and surrounded by the cloister covered with cupolas. The mosque has semidomes on all four sides of the main dome, and each of these has two subsidiary semidomes, except at the west, where the design of the Ahmed Mosque is recalled by three subsidiary semidomes. The external porticos and galleries and the position of the two minarets follow the arrangement of previous mosques, which had now become a settled tradition.

The main dome, of 53ft. 6ins. internal diameter, is carried by four great arches 7ft. 7ins. wide, and its circular plan is produced by simple pendentives. A deep cornice of stalactite corbelling is set above the pendentives, and its projection forms a gallery around the base of the dome. Earlier domes usually spring with a slightly-tilted curve immediately above the pendentives, having a range of windows and buttresses at the base. Here, however, the dome is raised on a definite drum, and the windows and buttresses are applied to it instead of to the dome. The builders seem to have been aiming at a greater effect of space and height.

Dome Construction.

The drum of the dome is built of brick, plastered internally, and with its external buttresses covered with heavy sheets of cast-lead. The dome itself is also covered with



THE YENI VALIDEH JAMI.

lead externally, while internally its material is concealed beneath a coating of plaster or repeated whitewashing; but it is doubtless also constructed of brick. The pendentives of the dome and its four great arches are built of stone. The semi-domes are covered externally and internally as the dome, and are probably built of brick, while their

subsidiary apses and pendentives are of stone. Brick was obviously used for the sake of its lightness and adaptability.

Mr. Reynolds said he could have wished to throw some light on the construction of domes such as this, and also on its relation to the construction of Byzantine domes, but he regretted to be able only to give a little definite information. In the earlier domes the springing of the curve is considerably below the top of the buttresses, so that some of its possible thrust is absorbed by them; and, moreover, certain additional flying buttresses point to this intention. But in this mosque the curve of the dome springs from the top of a drum and above the buttresses, so that the principle of abutting any thrust is put out of the question. The only alternative is to regard the dome as constructed in such a way as to have no thrust, but whether this is effected by means of a system of bonding-stones or chains, or by some adjustment of the jointing, Mr. Reynolds offered no opinion. Constant familiarity with domical construction has given Oriental builders certain methods which, to our inexpert timidity, seem almost impossible, and these methods become the more mysterious and tantalising in that they are practically inaccessible to investigation.

Windows.

One of the most striking features of these mosques is the great number of their windows. All of them are small and of about the same size, and they are filled with roundels of glass embedded in plates of plaster tracery. This principle of minutely subdividing the lighting areas is characteristic of the East, and is due to the need of tempering the dazzling sunlight; and the preference, for a large number of small



THE MOSQUE OF AHMED.

windows, scattered more or less equally throughout the building, completes the same idea on a larger scale.

Masonry.

The masonry is built of white limestone in fairly large blocks. The courses are more or less continuous, and vary considerably in depth, and the joints are fine. Marble is introduced in the porticos and galleries, and discs of green and red marbles are inserted here and there in the masonry, and the voussours or the arches are alternately pink and white.

The Decline of Mosque Building.

By the end of the seventeenth century the Turkish Empire had passed the meridian of its power, and the subtle relation between politics and art was reflected in a decline in energy and taste of building. For more than a hundred years no great mosque was built, and the Mosque of Sultan Osman, erected in 1748-55, shows the first signs of Western influence, a taint of the Rococco Renaissance. The scale of building is smaller than in any of the previous imperial mosques, and the plan is treated with a certain freedom which shows an effort after novelty. The forecourt is of a unique shape, the western bays being set out on a semi-decagonal form. The several bays are covered with the usual cupolas on pendentives, and the interspaces are covered with barrel-vaults. The mosque itself consists of a single great dome set on pendentives, and the most remarkable point of construction is the way in which these are carried. The weight is not taken by the solid walls, but by four great arches, which spring from piers at the angles of the mosque, the walls themselves becoming mere filling. At first sight it would appear that the arches are merely decorative, and that the walls take much of the direct weight, after all; but the tympana are so pierced with windows that there is little strength of masonry left. The arches evidently take the weight of the dome, and they depend on the remarkably slight abutment of the angle piers. The dome is of light construction, and the piers are weighted with turrets, but the design is certainly very daring; and the dome, with an internal diameter of 8 ft. 6 ins., is no plaything, being the second largest Turkish dome in Constantinople. Although the construction is still distinctively Turkish, the decoration has become an extraordinary Saracenic version of the Rococco Renaissance. Mouldings are freely used, and often with very refined profiles; but the walls of the forecourt and the interior are frittered with pilasters, and the fine simplicity of typical Turkish work has been almost altogether lost.

The original mosque of Mohammed the Conqueror, the first to be built in Constantinople, had been shaken by the earthquakes of 300 years, and, in 1768, its almost entire rebuilding became necessary. The new mosque has little relation to the original design, for it follows the fully-developed model of the Ahmed Mosque. The scale is still very great, but the forms are tainted with the Rococco corruption. Turkish art was fast declining in its course, and was now moving only by the force of its fall.

Minarets.

The minarets give more character to the mosques and to the whole city of Constantinople than any other single feature. No mosque was virtually complete without a minaret, but the desire for increased magnificence soon multiplied their number. Their primary use was to elevate the "mueddin," who summoned the faithful to prayer, so that his voice might be heard above the surrounding roofs, but the minarets grew quickly beyond this first necessity, and if the "mueddin" were to chant his call from the upper balconies of later minarets, his voice would be almost lost in the clouds. The minarets are also used for illumination, and on the nights of the great religious

festivals their balconies glitter with thousands of lamps all over the city. The minarets of the Yeni Valideh Mosque rise to about 240 ft. above the ground, but several in Constantinople must be considerably over 300 ft. in height. The roofs are steeply conical, framed with wood and covered with lead, and terminated with a finial bearing the crescent. The smaller minarets have two balconies, and none have more than three. The design of all the minarets is practically identical, the shafts being polygonal and slightly reduced in diameter above each balcony. It has been said that Turkish minarets are the ugliest form of a singularly beautiful feature; but they may claim to have that relative fitness which is the greater part of beauty. Although in themselves they may lack the rich outline of Cairene minarets, yet Cairene mosques have not that complexity of cupola and dome to which the severer elegance of the Turkish minaret acts as a necessary foil.

Internal Decoration.

Many of the mosques have lost much of their original splendour, and are now largely decorated with nothing more elaborate than whitewash. But even this harmless treatment is better than the horrible mixture of corrupt Saracenic and Rococco painting with which the modern Turk has desecrated some of the mosques. One great mosque, however—the Ahmed—has entirely retained its original painting, although restored to some extent. The upper parts of the walls are covered with diaper patterns of conventional foliage and flowers, and the arches and domes are bordered with running designs and set with foliated discs at the crowns. The pattern is applied on a white ground, and the colours are chiefly blues and greens, brightened here and there with red; and the effect would doubtless be very beautiful if the brightness of the innumerable windows was still tempered by their original tracery. But modern glazing has here done its worst, and in the excessive light the gaiety of colour appears tawdry and even vulgar.

The Original Tilework

often remains on the lower parts of the walls. The earlier tiles are of a rich azure blue laid on a white ground, or conversely treated, and geometrical shapes or foliage with pomegranate flowers are the principal decorative motives. The fertility of design is amazing and the combination of different effects most ingenious, while the prevailing blue and white gleams here and there with most effective touches of emerald green and red. A wider range of colour and pattern was used in later tiles, but with the widening of resource came a tendency to over elaboration and ineffective cleverness. The tiles are fairly large, and the pattern seems to have been painted on large slabs, afterwards cut up for the process of firing, for the joints often have no relation to the design. The tiles were imported and their designs were obviously inspired by Persian influence. Such tiles were used for the partial decoration of the greater mosques, and especially for the enrichment of the Mecca niche, but the interiors of the smaller mosques and the *turbahs* or tombs were sometimes thus decorated completely. The mosque of Rustem Pacha is one of the finest earlier instances of this treatment, and the *turbah* of the Shah-Zadeh Mosque is a good example of the later work.

Oriental Method of Decoration.

The essentially Oriental method of decoration is the application of colour to the flat constructive surfaces, and is opposed in principle to the Western method of light and shade by relief. Santa Sophia is a pre-eminent instance of this Oriental method, and its marble plating and mosaic were represented in the Turkish mosques by tilework and painted decoration. Hence, carving (always in marble) was comparatively unimportant.

It was chiefly used for the enrichment the ritual fittings, and was rarely applied the main structure except in the form of stalactite work.

Stalactite Work

may be defined as a horizontal and vertical series of arches, those of each course springing from the apices of those below, so that the general surface advances by degrees; but the original scale of the arches was gradually reduced until they became a mere sculpture-mimicry, no longer arcuated, but corbelled in construction. This freedom from structural limitation allowed a complication of plan form and grouping which defies description, and sometimes almost defies analysis, and the later stalactite work may be regarded as the *tour-de-force* of that mathematical ingenuity which has always distinguished the Oriental mind.

Unlike Byzantine building, Byzantine decoration seems to have exercised no direct influence on Turkish art, and its decoration remained purely Saracenic until the final corruption with Rococco trivialities.

Fountains.

The greatest richness of carving was lavished on the pulpits.

Another feature especially selected for enrichment of carving was the fountain in the forecourt, mainly, no doubt, because of its ritual significance. The earlier fountains were often shaded by a pent-roof supported on shafts; but the single fountain was soon found inadequate, and later mosques have long ranges of washing-places under the external galleries, the fountains in the forecourt being retained as cisterns. These later fountains are usually octagonal, with engaged shafts at the angles carrying arches, and with the interspaces filled with bronze or marble grilles. The cistern is enclosed within this octagonal arcade, an outlet for the water being pierced through each side, the whole being crowned by a crested stalactite cornice and covered with a cupola.

Discussion.

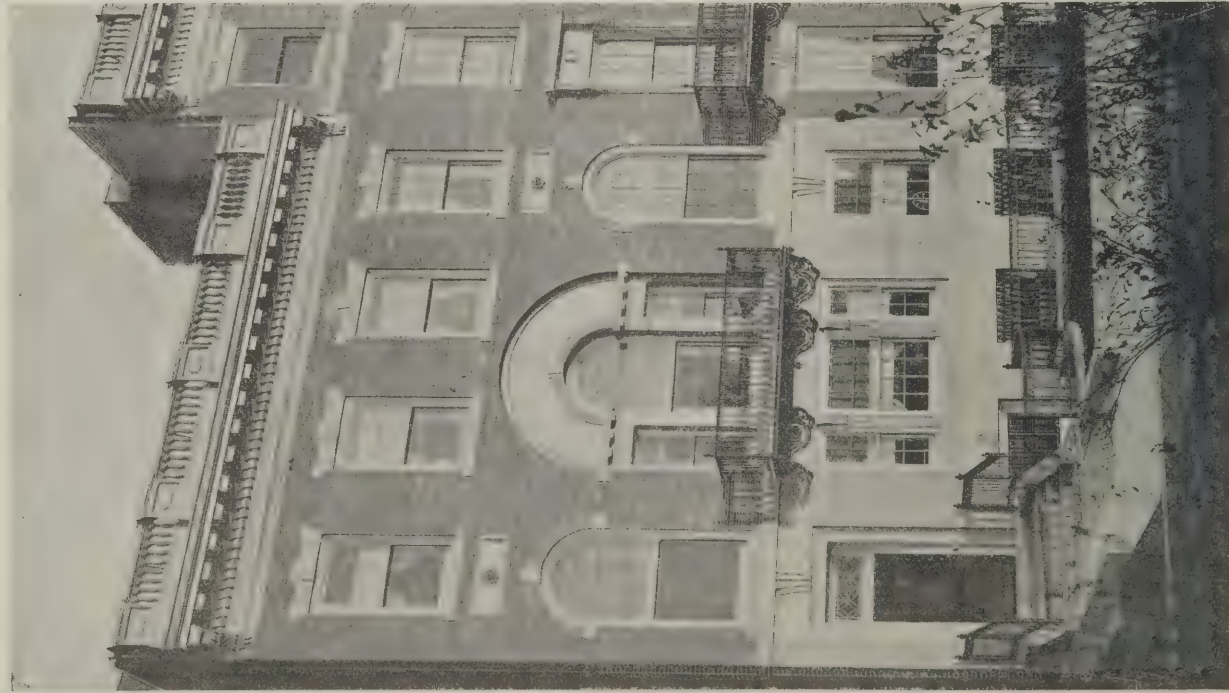
Mr. R. Phené Spiers, in proposing a vote of thanks to Mr. Reynolds, mentioned that nearly forty years had passed since he visited Constantinople. He then had great difficulty in obtaining drawings, but was fortunate to be able to get into Santa Sophia for three days as assistant to the Sultan's photographer. It was the form of this building, so often copied, which gave to the Turkish mosques as a whole a grandeur both externally and internally which the architecture in detail would not afford.

Mr. A. E. Henderson seconded the vote of thanks. He said the poorness of the later decoration in the mosques was due to the fact that the decorator was generally a Greek of low taste. The Moslem, by his religion, was also prohibited from having any representation of life, the only forms used being foliage and geometrical pattern; hence the tameness of the design. The small windows were far preferable to large ones, as they kept out the heat better, and in the winter the air was not so easily chilled as it would be with a large surface of glass.

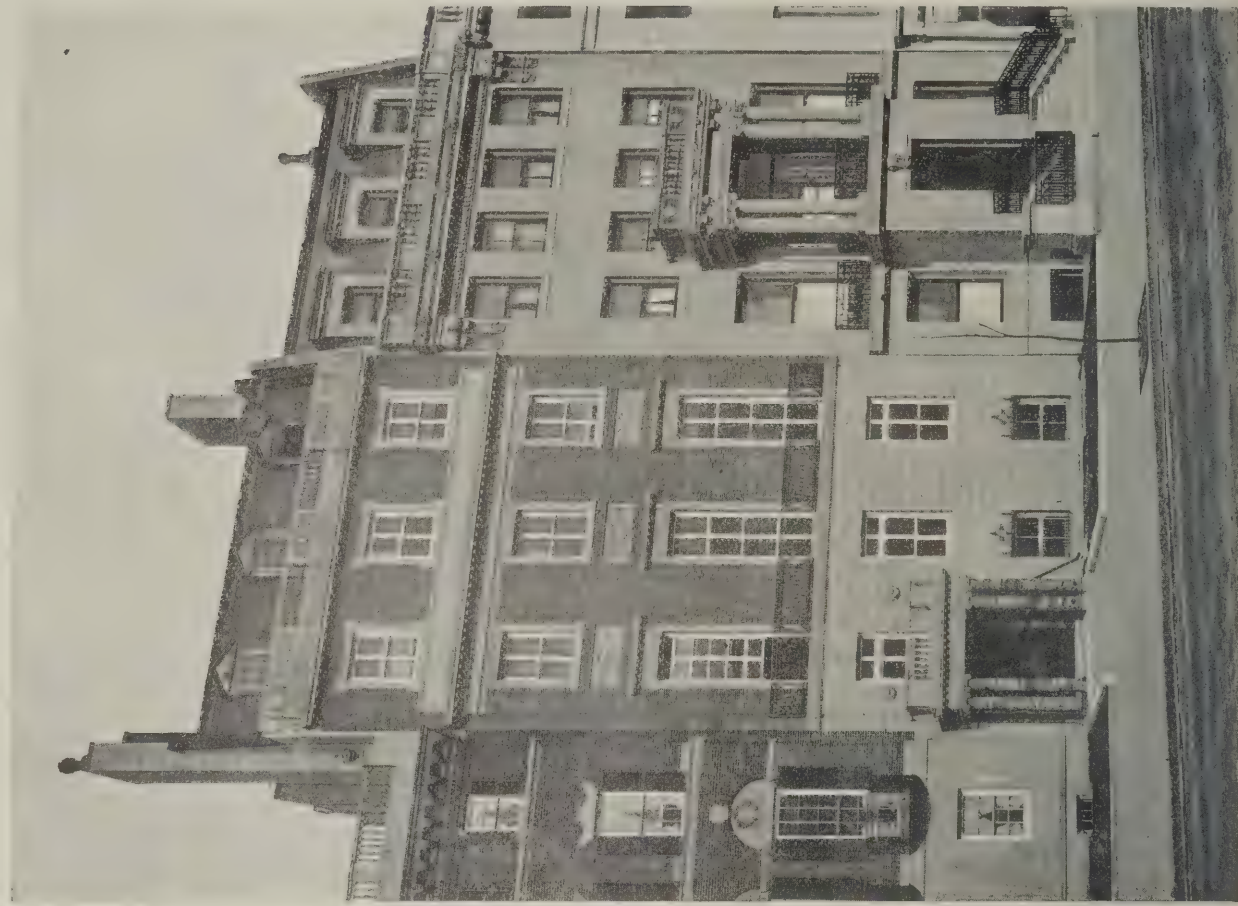
Mr. J. B. Fulton supported the vote of thanks, remarking that they ought to know more about Turkish architecture, as it was carried on in the Byzantine style, undoubtedly the finest the world had produced. They had seen this style adapted to modern requirements in this country, but the result achieved was not equal to what the Turks had done. Turkish decoration had been a revelation to him. He had studied all kinds of floral decoration, including the "New Art," but in Turkey his eyes were opened to a new treatment altogether. He did not say the designers always reached the height of beauty, but still there was very much to learn from Turkish decoration.

The chairman also spoke, and Mr. Reynolds briefly replied.

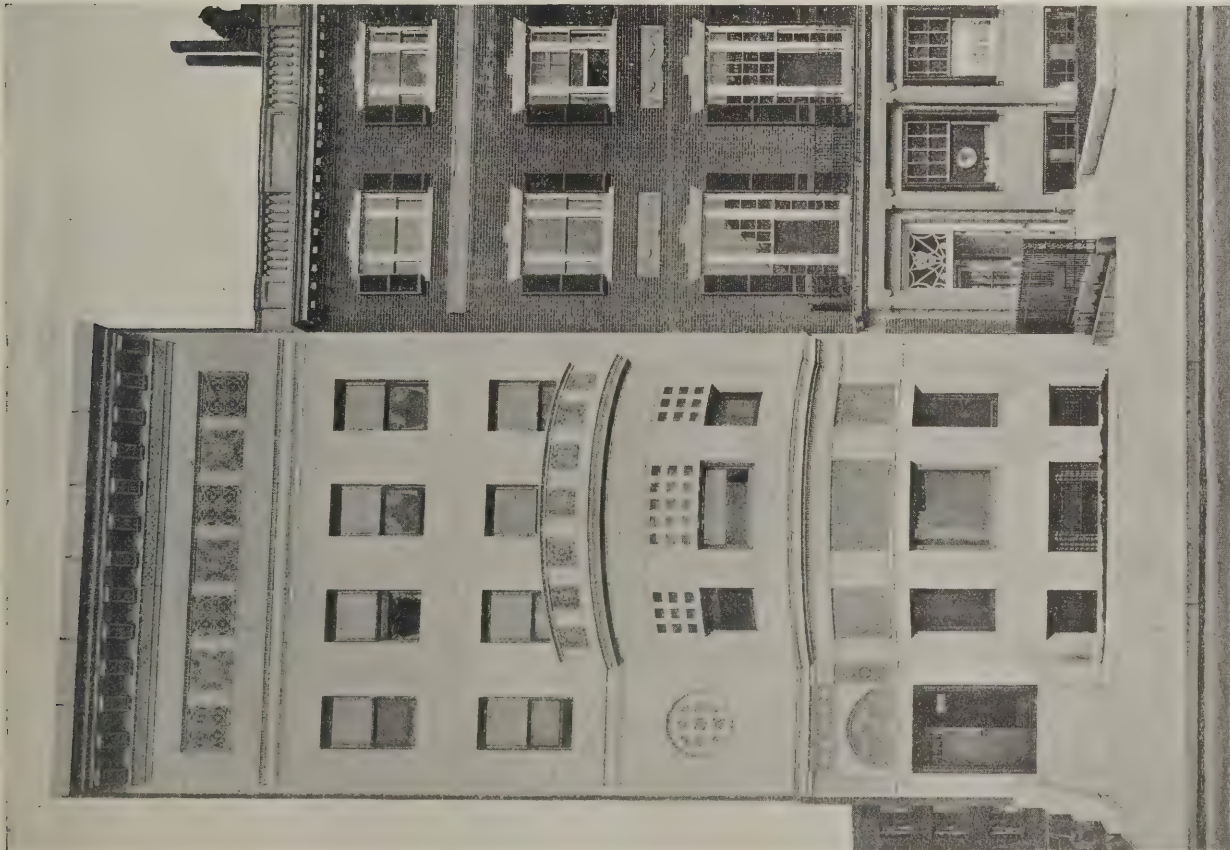
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NEW LONDON BUILDINGS.

AT yesterday's meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894, their recommendations as to consent or refusal being appended in *italics* :—

One-storey shops in front of Nos. 431 and 433, Edgware Road, Paddington, on the further application of Gardner & Theobald, on behalf of Matthews & Sons, Ltd. (*Refusal.*)

One-storey shops in front of Nos. 435 and 437, Edgware Road, Paddington, on the further application of Gardner & Theobald, on behalf of Meux's Brewery Co., Ltd. (*Refusal.*)

One-storey shops in front of Nos. 439 to 451 (odd numbers only), Edgware Road, Paddington, to abut also upon Maidia Hill West, on the further application of Boehmer & Gibbs, on behalf of W. Hirsch. (*Refusal.*)

New streets for carriage traffic, the widening of existing streets, and in connection therewith the erection of buildings upon the estate of the Cadogan and Hans Place Estate (No. 3), Ltd., on the south-eastern side of Fulham Road and the south-eastern and north-western sides of Cadogan Street, Chelsea, further application of Bouchier, Burmester & Galsworthy, on behalf of the Cadogan and Hans Place Estate (No. 3), Ltd. (*Consent.*)

Buildings on the northern side of Coddington Hill, Brockley, on the application of J. W. Webb. (*Consent.*)

An addition to an iron and glass shelter at the entrance to the Royal Theatre, Nos. 73 and 74, Dean Street, Soho, on the application of Smee & Cobay, on behalf of K. Santley. (*Consent.*)

An iron and glass shelter in front of the Prince's Theatre, East India Dock Road, Poplar, on the further application of Owen & Ward, on behalf of C. Soumes. (*Consent.*)

Buildings upon a site abutting upon the western side of Chatham Place and southern side of Belsham Street, Hackney, on the further application of Hodson & Whitehead, on behalf of Hodson & Rowlandson. (*Consent.*)

House on the northern side of Church Lane, Tooting, to abut upon the western side of Moring Road, on the application of Nash & Lillywhite, on behalf of J. S. Trotter. (*Consent.*)

An addition at the side of the porch at No. 5, Oppidans Road, Primrose Hill, Hampstead, on the application of W. E. Sanders, on behalf of C. Braby. (*Consent.*)

Retention of a projecting hood to a cottage at the rear of No. 69, Clapton Common, Hackney, abutting upon Braydon Road, on the application of A. C. Jackson. (*Consent.*)

Retention of projecting signs at No. 151, Englefield Road, Islington, on the application of A. Grahnam. (*Consent.*)

Retention of a greenhouse at the rear of No. 66, Sotheby Road, Islington, southward of No. 64, on the application of A. Mitchell Torrance, on behalf of H. C. Harris. (*Consent.*)

Porch to a house on the eastern side of Kersfield Road, Wandsworth, on the application of A. Williams. (*Consent.*)

One-storey shop as an addition to No. 54, High Street, Tooting, on the application of S. S. Dottridge, on behalf of E. Dottridge. (*Consent.*)

Projecting shop front with cornice and wooden trusses at No. 105, Church Street, St. Marylebone, on the application of W. R. Phillips, on behalf of W. Prested. (*Refusal.*)

Iron and glass porch at No. 54, Glenlock Road, Hampstead, abutting upon Glenilla Road, on the application of H. Edgerton. (*Refusal.*)

One-storey shop on land adjoining the Catholic Apostolic Church, Gordon House Road, St. Pancras, on the application of S. E. Spencer. (*Refusal.*)

A wood and glass showcase to No. 224, Regent Street, to abut upon Argyll Place, on the application of F. Sage & Co., Ltd., on behalf of T. & J. Perry. (*Refusal.*)

Building (University College Hospital, Medical School and Nurses' Home) on a site abutting upon Gower Street, University Street and Huntley Street, St. Pancras, on the application of Paul Waterhouse. (*Consent.*)

Re-erection of Nos. 48 and 49, Jernyn Street, St. James's, with balconies, on the further application of W. Woodward, on behalf of S. T. Miller. (*Consent.*)

Deviation from the plan approved on June 5th, 1905, for the erection of a building on a site abutting upon the west side of Mare Street, and north side of London Lane, Hackney, so far as relates to an increase in the height of the building, on the application of C. G. Smith, on behalf of W. Fritin. (*Consent.*)

New street for carriage traffic upon the Sanders estate, to lead from Denmark Hill to Dumbleton Road, Lambeth, on the application of R. Ellis & Son, on behalf of A. A. Sanders. (*Consent.*)

Adaptation as a street for foot traffic only of a way known as "Reuben Street," out of the east side of Brady Street, Bethnal Green, on the application of A. P. Stokes, on behalf of E. Seward and R. W. Seward. (*Refusal.*)

Retention of the engineer's cottage at the Grove Hospital on the north side of Blackshaw Road, Tooting, with the forecourt boundary fence at less than the prescribed distance from the centre of the roadway of the street, on the application of W. T. Hatch, on behalf of the Metropolitan Asylums Board. (*Consent.*)

Buildings with projecting oriel windows and balconies, on a site abutting upon the west side of Kingsway, and upon the sites of No. 3, Great Queen Street, and No. 64, Parker Street, Strand, on the application of A. Sykes, on behalf of O. Owen. (*Consent.*)

A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of buildings on the west side of Streatham Hill, at the corner of Drewstead Road, Wandsworth, with an irregular open space at the rear and

portions of the buildings, extending above the diagonal line, on the further application of Taylor & Sons. (*Refusal.*)

A deviation from the plans approved on 6th December, 1904, for the erection of a building on the site of Nos. 36 and 36A, St. James's Street, and No. 64, Jernyn Street, St. James's, so far as relates to the substitution of one air duct for two air ducts, on the application of W. Woodward, on behalf of L. Thomas. (*Consent.*)

Retention of hoardings at the ends of Elborough Street, Southfields, Wandsworth, on the application of Palmer & James. (*Consent.*)

An extension of the period within which the erection of bay windows and a porch to No. 52, Priory Road, South Lambeth, was required to be commenced and completed, on the application of F. Hingston. (*Consent.*)

Bay windows and pent-roofs to fourteen dwelling-houses on the western side of Wallingford Avenue, St. Quentin Avenue, North Kensington, on the application of Trant, Brown & Humphreys. (*Consent.*)

One-storey shops on part of the forecourts of Nos. 29 & 31, Beacon Road, Hither Green, Lewisham, on the further application of H. Kent. (*Consent.*)

Re-erection of No. 26, Vaughan Road, Lambeth, on the application of G. G. Rogers, on behalf of H. G. Westcott. (*Consent.*)

A building at the rear of No. 132, Arnkask Road, Catford, to abut upon Torridon Road, on the application of H. Lewis-Upham, on behalf of H. Bown. (*Refusal.*)

One storey shop on part of the forecourt of No. 408, Merton Road, Southfields, Wandsworth, to abut also upon Lavenham Road, on the application of T. Aldred, on behalf of W. G. Davey. (*Refusal.*)

One-storey shop in front of No. 79, Victoria Street, Westminster, on the application of Griffin & Woollard, on behalf of H. Webley. (*Refusal.*)

Retention of a building at "Northcourt," Hampstead, with the forecourt boundary fence at less than the prescribed distance from the centre of the roadway of College Villas Road, on the application of Hudson & Hunt, on behalf of W. Scoot. (*Consent.*)

Addition to Nos. 10 and 11, Hop Gardens, St. Martin's Lane, Strand, with external walls at less than the prescribed distance from the centre of the roadway of Hop Gardens, on the application of George Trollope & Sons and Colls & Sons, Ltd., on behalf of Johnson, Matthey & Co. (*Consent.*)

The Theatres and Music Halls Committee reported having considered the following :—

A plan and specification, submitted by the town clerk of the Metropolitan Borough of Battersea, of a portable wood and canvas proscenium front and box scene proposed to be erected at the Battersea Town Hall. (The Committee was unable to recommend the Council to allow the erection of wood and canvas proscenium front, even though treated with a fire-resisting solution.)

Plans submitted by W. G. R. Sprague, on behalf of Seymour Hicks, showing the arrangements proposed to be adopted in the construction of a new theatre in Shaftesbury Avenue, with entrances to Wardour Street and Little Rupert Street. Accommodation is shown for an audience of 1,172 persons seated and 130 standing. (*Approval.*)

Plans, submitted by F. H. Payne and Bull & Bull, showing the arrangements proposed to be adopted in connection with the annexe at Olympia, Hammersmith, during the time the premises are used as a winter sports club. (*Refusal.*)

A plan, submitted by Emley & Sons, Limited, showing the proposed formation of a doorway between the engine-room and the heating chamber and the provision of a radiator in the passage-way near the stage entrance at the Princess of Wales's Theatre, Kennington Park Road. (*Approval.*)

A plan submitted by F. Matcham & Co., showing a proposal to place a low-pressure hot-water warming radiator in the vestibule at the Royal Music Hall, Holborn. (*Approval.*)

Plans submitted by E. Stephens, showing a proposal to form an opening 4ft. 6ins. wide in the back wall of the concert hall at the Royal Victor Hotel, 234, Old Ford Road, Bethnal Green, to provide communication between the concert hall and the part of the public-house premises adjoining, which will be used as a cafe. The formation of the proposed opening would bring the concert hall into the fire risk of the public-house, and the Committee do not consider that this should be permitted.

OUR PLATES.

IT is our practice occasionally to give some representative examples of current work in America, where the public buildings—libraries especially—are designed on a scale and with a sense of good proportion not often seen here. In that respect American architects owe much to French training, but as regards their house architecture quite other models are followed. From the four examples of new houses in Boston which we publish as a centre plate this week, it will be seen that old English types of Georgian and later days are adopted. The front designed by Mr. A. J. Manning is carried out in marble, and the decoration, presumably in small pieces, across the large bay window, over the doorway, and under the cornice, must be very delicate in effect. Of the other three designs there is nothing in particular to say: they speak for themselves, being straightforward pieces of brickwork with ornament sparsely applied: and though some persons may

think it incongruous for modern Americans to take up such an old thread, it will not be denied that the results are very successful, the houses being designed in a way which is far more pleasing than the generality of work which claims to be essentially and only of to-day.

ARCHITECTURAL ASSOCIATION.

THE following new members were elected at last Friday's meeting of the Architectural Association :—Messrs. Paul Faraday, P. R. Fincher, K. Dalglish, C. W. Long, H. W. Spark, T. C. Black, C. G. C. Payne, H. Griffin, junr., Harold Sudlow, F. C. Barrow, A. G. Taylor and Flint Browne.

The following further donations to the Building Fund were announced :—

	£	s.	d.
Charles Wall, Ltd.	-	-	25 0
E. R. Nixey	-	-	2 0
F. A. Forster (double subscription)	-	-	1 0
F. J. Lloyd	do.	-	1 0
F. E. Lloyd-Downes	do.	-	1 0
E. Boehmer	do.	-	0 10 6
J. W. Dennington	do.	-	0 10 6
J. K. Hunter	do.	-	0 10 6
Geoffrey Lucas	do.	-	0 10 6
C. A. Sharp	do.	-	0 10 6
A. Dunbar Smith	do.	-	0 10 6
W. Charles Waymouth	do.	-	0 10 6

SOME IMPORTANT STONE QUARRIES.

AT a meeting of the Society of Engineers held on Monday evening (Mr. Maurice Wilson, vice-president, in the chair) a paper was read on "The Grindleford Stone Quarries and their Working" by Mr. Benjamin L. Bradley.

These quarries are a section of the undertaking which is being carried out by the Derwent Valley Water Board for increasing the supply of water to Nottingham, Sheffield, Derby and Leicester, and which will ultimately cost between six and seven millions. The quarries supply the stone for building the dams, and are 52 acres in extent. They are situate about 10 miles from Sheffield. Their geological formation is one of the millstone grits of the carboniferous system, known as the Rivelin. The approximate quantity of good building stone is 2,400,000 tons. The quarries were opened in April, 1902, and the first consignment of stone was despatched to the dams in June, 1903.

The quarries are connected up with the Midland railway, and owing to the high altitude of the working faces (about 500ft.) above that line an incline rope-hauling cableway 750ft. long, and a zig-zag railway, were found necessary.

The haulage is effected by means of a 15ft. diameter winding drum, with two 1½in. wire ropes having hemp cores, the breaking strain on each of which is 80 tons, with a factor of safety of 8.

Owing to a change of level (about 300ft.) in the beds the quarries have to be worked at three different lifts. When the blocks of stone range from 100 to 400 tons each, they are pushed off their beds with screw-jacks. Blocks of less than 100 tons each are split into blocks of about 30 tons each, and pulled off after cleavage by cranes. The explosives used are gelignite and blasting powder.

Obituary.

Mr. George Langmaid, builder, of Liskeard, died last week, aged 78.

Mr. John Weller, who was one of the oldest architects practising in Wolverhampton, died recently.

Colonel Eaton, F.R.I.B.A., C.B., head of the firm of Eaton & Sons, architects, of Ashton-under-Lyne, died on November 26th. He studied architecture in the office of his father and in that of Mr. Moffatt, in Manchester.

CORYVILLE.

A Garden City near Cardiff.

WE illustrate on this page the scheme for "Coryville," the garden city which is proposed to be laid out on an area of about 200 acres on the Duffryn Estate at Peterston, near Cardiff, by Mr. John Cory, J.P.

The architect in charge of the work is Mr. W. Beddoe Rees, A.R.I.B.A., of Cardiff.

The site is surrounded on three sides by low hills and thickly-wooded slopes, which shelter it from the winds, while the fourth side is bounded by the River Ely, which is a striking feature of the scheme, as a considerable amount of money is to be spent in forming an embankment and making the river suitable for bathing, boating, fishing, &c.

The plan of the village is circular. In the centre will be a large green surrounded by shops, which will form the business centre, and no other shops will be allowed on any part of the estate. From this centre five avenues radiate, communicating with the Grand Avenue and the outer circles. The Grand Avenue will be about 60ft. wide. Around this will be the better-class houses, either detached or semi-detached, each on its own piece of ground, about a quarter or one-sixth of an acre in extent, so that each house will have ground enough for a tennis court and a kitchen garden. The second avenue will be devoted principally to the smaller houses and cottages, varying in cost from £200 upwards. These again will be chiefly detached or semi-detached, but on no account will a group of more than four be allowed together. As soon as all the plots are let another circle will be laid out, and the scheme enlarged as occasion demands.

The sewage treatment is to be on the septic tank principle, and the cost of it will be borne entirely by Mr. Cory, nothing being charged to intending tenants. There will be an ample supply of pure spring water, and each house will be connected by a separate main, for which there will be a small charge according to the water consumed. As to lighting, nothing is definitely settled yet, the respective advantages of gas and electricity being at present under consideration; it is probable, however, that gas will be adopted, though a small electric plant will also be laid down should the demand be sufficient. With respect to

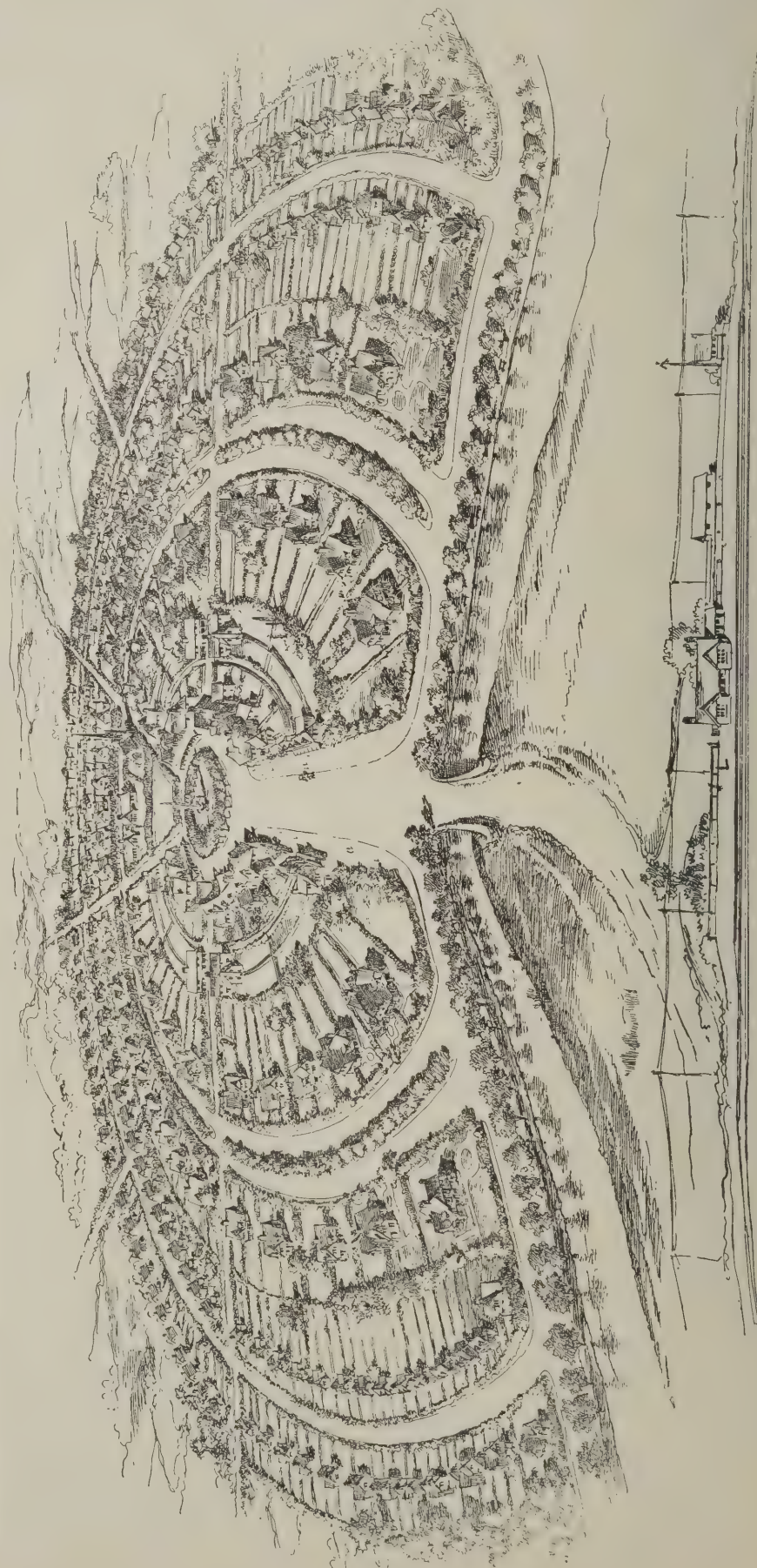
Ground Rents,

Mr. Cory is desirous of charging an amount which will show a fair return on the money expended, but it will be made as low as possible; we think we are safe in saying that it will be fully 50 per cent. less than the ground rents in other suburbs of Cardiff. In addition to laying-out the streets, planting them with rows of trees, providing the necessary drainage, and paying all other general expenses, Mr. Cory is prepared to offer every inducement to intending tenants, especially those who through adverse circumstances are at present unable to enjoy the benefits of a country home. A scheme is being prepared by which 80 or 85 per cent. of the money to build a house will be provided on security of the lease, and thus small holders will be able to occupy their own houses. This, worked out carefully, shows that if a man has £30 or £40 he can benefit by the scheme to such an extent that he can erect his own house with the money provided by the scheme which is at present being formulated. After allowing for the interest, paying back the capital, and a season ticket into Cardiff, the cost would total as nearly as possible what he is at present paying in rent only.

A limit will be placed on the amount of ground to be let, as it will be naturally unfair to let one person have an acre, and crowd out those who are really more in need of the benefits offered. Probably one-twelfth of an acre will be the minimum and one-quarter of an acre the maximum. Provision is being

made for recreation grounds, open spaces, a small park, &c., which, if the plots are taken up, Mr. Cory will lay out himself. A space is also to be reserved for churches or chapels and public buildings, such as a school, village hall and gymnasium, reading-room, lecture hall, and everything necessary for the instruction and betterment of the tenants. It is also proposed to erect a small unlicensed village inn, while sites for factories will be

available. But with regard to the erection of the houses Mr. Cory intends to leave this to the tenants themselves. The ground will be let on leases of ninety-nine years, and it will be for the lessee to erect a house according to his own requirements, though every help will be given by way of financial assistance. A prospectus of the scheme is being prepared, and will shortly be issued, giving plans and details.



"CORYVILLE," THE PROPOSED GARDEN CITY AT PETERSTON, NEAR CARDIFF. W. BEDDOE REES A.R.I.B.A., ARCHITECT.

Views and Reviews.

The New Architectural History.

This is the first of a series of volumes dealing with architectural history and practice which Messrs. Longmans, Green & Co. propose to publish under the editorship of Prof. F. M. Simpson, of University College, London. The series is well begun with this volume from the pen of the editor. By an advertisement in the book we see that he will follow the present volume on "Ancient, Early Christian and Byzantine Architecture" by a second one on "Mediæval" and a third on "Renaissance" architecture; while Prof. Beresford Pite, assisted by other authorities, will contribute two volumes on building construction. We presume that

Faultiness of Existing Histories.

the series is to be called, is intended to summarize and collect information from all sources for the guidance of students; therefore we must not look for anything particularly novel. We fully agree that such a series is needed, because existing books on building construction, architectural history and practice are in many respects unsatisfactory. They are seldom written by competent authorities, more often being contributed by men who are not in such demand that it is difficult for them to find time to write these works. In Professors Simpson and Pite we are fortunate in having two men possessing ability and considerable practical experience, who, by being selected to fill chairs of architecture, are enabled to devote time to this necessary part of architectural education, namely, the production of text-books.

The Need for a Modern History.

A history of architecture more recent and more practical than Fergusson's and fuller than Fletcher's no doubt would fill a place, but unless it were a material improvement we could only regret that it should occupy the market to the exclusion or delay of a really adequate history. For the moment we cannot judge whether Professor Simpson's contribution will be worthy to occupy the vacant place. This present volume is very good in some respects, but in others there is a lack of thoroughness and all-round grasp, due no doubt to the fact that Professor Simpson does not always speak from personal investigation, as indeed he admits in his introduction, having only visited Italy, Sicily, Greece, Turkey and Asia Minor. The beginnings of architecture are to be found in Egypt, Assyria, Persia, India and China. Of course it is almost hopeless to expect one man to have experience of all these countries. There are, unfortunately, no trustworthy authorities who have thoroughly investigated the architecture of these places and published the results so as to enable an historian to collect, correlate, compare and criticize the discoveries and build up an adequate rendering of the beginnings of architecture. There are many theories, it is true, mostly supported by little or no evidence. It requires a trained archaeologist to prepare the way, but failing complete sources of information there is no doubt much to be learnt by an experienced architect who should see what does exist at first hand.

The Scientific Historian.

We have men of scientific training enough nowadays to interpret the art and constructive science of the past better than ever before. A conspicuous example is M. Choisy, whose work upon Roman architecture taught us more than all the architects of the Renaissance had discovered, and even more than a contemporary like Vitruvius could tell us of the work of his time. M. Choisy has recently done a good service in regard to Egyptian architecture, and Professor Petrie is fortunately an archaeologist of sufficient ability to assist in the interpretation of this architecture. The late Mr. F. C. Penrose and

other workers have likewise cleared up later Grecian work, while Viollet-le-Duc set an example in regard to Gothic work. Renaissance work is near enough to our time for all to grasp; but though Egypt, Greece, Rome and the architecture that followed in regular evolution have been fairly well investigated, a beginning has only recently been made in regard to Assyrian and Persian work, while the elucidation of Mycenaean pre-Grecian culture has only within the last year or two been made. The latter, indeed, has gone far enough to show that Grecian architecture evidently derived much from Egypt, although it also contains elements of Assyrian and Babylonian work.

Before Egypt.

It has nowadays become plain that work in Asia, more especially in regard to the decorative elements, sprang from some underlying art culture that preceded even the early Assyrian work which existed several thousand years B.C. From this culture, which has yet to be ascertained, sprang Indian and Chinese work, no doubt. As to whether it emanated from Egypt, or whether Egyptian art (the earliest examples of which apparently go back to 10,000 B.C.) was derived from it, has yet to be proved; while it now becomes a question whether Assyrian culture antedated Egyptian. The early beginnings of civilization are difficult to trace, and until we have more knowledge the beginning of architectural history cannot be completely cleared up.

What Professor Simpson has done.

This only shows the difficulty. Professor Simpson starts a good way on the road, and although he is to a great extent on safe ground we think he might have been somewhat bolder and done somewhat better. In fact, starting so late as he does it is impossible to assign adequate reasons for architectural forms without some reference to early art and constructional need outside Egypt, which he deals with fairly well, and Assyrian and Mycenaean work, with which he deals only scantily.

Professor Simpson treats his subject from the evolutionary standpoint; that is to say, he deals with the history of civilization, knowledge acquired from former civilizations, the needs of the people, wealth and trade, command of labour, the geography of countries, materials and the construction that sprang from them, motives in the design of details, &c.

While his treatment of materials and construction is on the whole satisfactory, we do not think sufficient attention is paid to tradition, to geography and climatic influence, to the temperament of the peoples, their religions and ideals, and the needs of their civilization. Where the author does describe the geography of a country he does not provide

Maps Wanted.

plans, and consequently a clear idea cannot be carried in the student's mind; while if the latter refers to maps of the country as it exists at present, or even maps in ordinary histories, these give no idea of the country as it existed at the time referred to.

The Influence of Religion on Architecture.

The influence of religions and ideals does not need explanation on our part. We only mention it because architects and historians up to the present—and Professor Simpson is no exception—have overlooked the great influence of these on architectural development. A typical instance of what might be done in regard to this, and the conclusions that might be drawn from an intelligent view, is to be found in the late Mr. Ruskin's eloquent chapter on "The Nature of Gothic" in the "Stones of Venice." The architecture of the Egyptian temples and tombs (little else is known) was entirely conditioned by the religion of the Egyptians, and Professor Simpson is only one more author who has been led to an inadequate treatment of the subject by a neglect of this important fact.

The Critical Examination of Plans.

Few historians have ever attempted to critically examine the plans of ancient buildings and point out the needs, elementary or complicated, which they served, and how satisfactorily or unsatisfactorily they did so. It is of course difficult to ascertain this in regard to most ancient buildings, but we can at least seek for near approximations on the more important points in Egyptian and Grecian work, and the buildings succeeding this last civilized era.

In the space at our command it would be impossible to deal with all the matters touched upon by Professor Simpson. His book is an interesting running commentary upon points which have agitated the architectural profession in the past, and will continue to do so. He advances perhaps few new views, but he manages to state ideas very clearly; and although we are often inclined to quarrel with some of his conclusions, they are at least not due to want of thought.

Origin of the Orders.

For instance he disputes the timber origin of the orders of Grecian architecture. It is perhaps well that he should take a partizan view, because the suggested origin has been too readily accepted, but we think there is something in it after all. He seems to argue that if we admit that the Greeks founded their architectural forms upon a timber original, their ability as architects becomes debased. There is no doubt that Grecian work is particularly lithic, but it cannot be expected that the Greeks, more than any other nation, should have been able in the short period which we know it took for the development of their architecture to get away from all the existing types. They may not have been so conservative as to blindly follow tradition (probably were not), but their education must have come from the observance of existing buildings, and their detail shows that they took their knowledge from existing forms of ornament. Some of the work is distinctly suggestive of Egypt, some of Assyria. They went back, it is true, to the foundations of knowledge in many cases, i.e., built their knowledge on experiment and the copying of nature, but they had to take much on trust. The naturalistic tendency just referred to is

found in many climes and many times. We must not always suppose that a form of ornament or a form of construction was always obtained from some previous civilization, because we know that where no communication with outside nations has taken place, such as with savage races upon islands like Australia, New Zealand and smaller islands of the Pacific, the work is often distinctly akin to early decorative forms to be found in such countries as India, Mycenaean Crete and Greece, and China, but it takes a long time for people to advance even a little way at the beginning, although the pace increases as they go on.

A good beginning.

Professor Simpson in this book carries us as far as early Christian and Byzantine architecture, and it will be interesting to read his other volumes. The book is a serviceable introduction for any student, and it is compiled in a way that will teach him to think, which, after all, is the chief thing. The illustrations are clear, but they are not so numerous as they might be; moreover, they are small, though not so cramped as often is the case in books on architectural history, so that this volume is superior in that respect. The manner in which Professor Simpson has performed his task is suggestive that when he comes to deal with architecture nearer our time—architecture which he has personally investigated—he will have produced a work of great educative service.

"A History of Architectural Development," Vol. I., by F. M. Simpson. London: Longmans, Green & Co., 39, Paternoster Row, E.C., price 12s. 6d. nett.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Screens.

H. writes: "Please give a list of the figures and their positions on the great screens of Winchester and St. Albans, and some particulars of the one at the Priory of Christ Church, Hants."

A book entitled "The Great Screen of Winchester Cathedral," by G. W. Kitchen, D.D., Dean of Durham, published by Simpkin & Co., Ltd., Stationers' Hall Court, London, will give the information you require upon the Winchester screen. Particulars of the St. Albans and the Christ Church screens will be found in "The Cathedral Church of St. Albans" and "Wimborne and Christchurch" respectively, both by the Rev. Thomas Perkins, M.A., and published by George Bell & Sons, London. All these books are to be found in the library of the R.I.B.A. H. Y. M.

The Theseum, Athens.

WALTHAM ABBEY.—STUDENT writes: "In the Theseum at Athens is the sculptured panel over the angle column as illustrated in Normand and Mauch's parallels of the Orders correctly so placed? On which angle of the temple does it occur, and what is the subject of the panel next to it? I cannot find this illustrated in 'Stuart and Revett,' but hope you may be able to give me the desired information."

The metope sculptures of the Theseum shown in Normand's and in Mauch's "Orders of Architecture" seems to be an invention based upon one of the actual metope sculptures of this temple which is illustrated in Stuart and Revett's "Antiquities of Athens." This sculpture represents Theseus driving the Bull of Marathon into Athens. The correct position of this panel is second from the angle on the south side at the east end. The angle metope represents Theseus destroying the Minotaur. In the Theseum there are eighteen sculptured metopes, ten being on the east end and four on each flank at the south-east and north-east angles. All these metopes are illustrated in the "Antiquities of Athens," Volume III., Chapter I., Plate XIII. H. Y. M.

Water-supply from Wells.

SOUTHPORT.—J. M. writes: "What is the most economical way of getting water from a well 90ft. from the point where it is wanted? The well is about 10ft. deep. At present a hand pump is placed about 10ft. away, and wooden gutters have to be fixed each time it is used."

The most economical plan depends upon the circumstances of a particular case. There are two ways in which the water may easily be delivered at your house:—(1) Substitute a 1½in. galvanized iron pipe for the wooden gutters you have hitherto employed; leave the pump where it is, and put a galvanized iron tank under it to contain the storage for the house. A tap at the lower end will enable you to draw water at any time. (2) Put a pump in the house, lay 1½in. or 1in. pipe to the well, and pump at the lower end. There is no difficulty in making a pump draw that distance as the lift is only 10ft. The latter is the better plan. F. S. I.

Street Frontages.

MOSELEY.—X. writes: "Referring to the reply to my enquiry on p. 286 of your issue for November 15th, I regret to say the point has been missed. The portion coloured red was the intended building, and should have been more clearly defined as such, whereas the whole of the letters A, B, C and D denote existing ones. The query was as to whether the building line should be between the front lines of buildings B and C and be defined by them, or between those of A and D and defined accordingly. The surveyor's contention was that the buildings B and C were not buildings in accordance with the Act referred to, and that the building line should therefore be defined by the buildings A and D. The query might in other words be expressed as follows:—Are the buildings B and C buildings in accordance with section 3 of the Public Health (Buildings in Streets) Act, 1888?"

The Public Health (Buildings in Streets) Act, 1888, section 3, distinctly says "house or building . . . or any part of such house or building" shall form the frontage line. There is no doubt that the buildings B and C form the frontage line between them. Are they not "buildings" in the sense that if proposed to be erected now they would be under the by-laws; and so, by the same rule, are they buildings capable of defining the frontage line? F. S. I.

Book on Stone-working Machinery.

FRITH.—G. J. B. writes: "Which is the best book on stone-working machinery? I have Powis Bale's, but it is quite antiquated in view of the advance made in this class of machinery during the last seven or eight years. I should like to know if there is a publication of the kind quite up to date. There seems to me to be a great call for such a book."

We believe Mr. Powis Bale's book on stone-working machinery is the only one that has been published. We have never heard of any other. A second edition of it was published a few years ago, in which some additions were made, but the demand is not sufficient at present to enable Mr. Bale to bring it right up to date.

Builders' Agreements.

ARMAGH.—D. P. M. writes: "Please give particulars of the best law book relating to builders, concerning their agreements with architects and owners."

"Building Contracts," by Frank W. Macey, price 15s. post free from our offices.

Removing Grease Spots from Paper.

GILLINGHAM.—H. G. writes: "Can you recommend a satisfactory method of removing grease spots from drawing paper?"

There is no process for removing grease that we know of. The best plan would be to cut the patch out and substitute another.

Gate-posts.

Referring to the enquiry about gate-posts on p. 316 of our issue for last week, Mr. W. A. S. Flitton, of Wellingborough, writes: "It might be of interest to your correspondent to know that six months ago I fitted up eight farm gates with reinforced-concrete posts, and although they have been subjected to some rough usage from carts, ploughing engines, &c., they are as good now as on the day when they were put up, and look like standing for a century. They were made with 1 of cement to 4 of limestone (crusher-run), reinforced with four ¾in. round-iron bars placed vertically one in each corner of the post. The posts are 9ins. square and 6ft. 6ins. high; 4ft. 6ins. above and 2ft. below the ground. All the ironwork, hinges, &c., was put in position while the posts were being made. They are rather heavy, but as they can be made where they are required this is

not disadvantageous. For front gates they could be made in any colour, and no building material lends itself more to artistic treatment than concrete, provided it is not daubed over with a finishing coat to make it appear to be what it is not, i.e., natural stone. The cost of these posts would not be more than half the cost of oak posts."

Mr. Harry Hems, of Exeter, writes: "Your correspondent's remark that it is difficult to get oak for gate-posts, roins, by roins, without sap is a curious confession. No doubt there is comparatively little good English to be obtained in the metropolis, but timber merchants throughout the country have always plenty of it on hand for disposal. Still, failing English, there is a glut of Stettin and Dantzig at all times on the London market, and it takes a clever man to distinguish much of either of these (when worked up) from ordinary English. Both are very cheap, and I have had three truck-loads of Stettin delivered at my yard this very week at 3s. per ft. cube. So far from sap existing in it, I never saw an inch of sap in a Stettin or Dantzig log in my life, and I have handled thousands of them during the last half-century. If your correspondent is careful to well tar the posts below and for a few inches above the ground line, there is little fear of their rotting. I have quite a number of oak piles in my possession that were driven into the Exe by Mayor Gervase in A.D. 1231 to form the foundations of the bridge he built across that river. They remained *in situ* until early in the present year, when they were dug up again, and after remaining 774 years in mud and water are everyone of them now as sound as a bell."

The Lighting of Rooms.

GREAT BOOKHAM.—SUBSCRIBER writes: "Which is the best way to secure the greatest amount of light into a room which is to have a balcony projecting 7ft. in front? The height from verandah floor to under-side of fascia is 8ft. 3ins. Is it possible to make a good job by introducing glass into the lead flat, and how is it best done in order to prevent a drip on under-side of balcony?"

We suggest the use of an ordinary prismatic glass pavement light in the floor of the balcony. Directions for fixing this so as to prevent water dripping through will be given by the makers.

Corrosion of Solder on Ball Valve.

ASHWELL.—B. writes: "Can you give me any explanation and remedy for the solder to a copper ball-valve to a w.c. flushing cistern becoming eaten up and rotten? This has happened twice since the spring, and the solder to the ball itself where it touches the water has perished. The last time I put on an entirely new ball, but this has gone just the same. A hole has also appeared in a small lead pipe which is in the cistern. There is a white deposit on the pipes."

If the cistern be supplied with rainwater, and pigeons kept, it is their droppings that have turned the water into a mild acid, which has set up between the copper of the ball and the zinc in the solder the electro-chemical action of a galvanic battery that has destroyed the solder's nature. The cure for this is to use solder that has no zinc in it; another is to use iron pipes (galvanized ones will soon be ungalvanized). If spring or town-main water be used it may be that the acid for soldering has run or dripped into the cistern in sufficient quantity to make an acid of the first filling of water, and the mineral salts of the water have been strong enough to complete the destruction. In this case great care must be used when soldering. If the water be strongly mineral, the only remedy is copper pipes, with connections either brazed, flanged or screw unions.

O. WHEELER.

Correspondence.

Preston School Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Since reading the remarks in your journal in regard to this competition I have seen the designs on view at the Harris Institute, Preston; and although I do not think it probable that any action on the part of competitors will alter the result as regards the award of the premiums or the appointment of the architects for the work, I agree with you that some protest should be made by competitors themselves against the injustice which has been meted out to them in this competition. The award of the premiums to the designs selected (particularly the first and second) is so flagrantly wrong that competitors should readily join in some protest. This I imagine would take the form of a protest to the Corporation, and if so, and as one of the competitors, I should be pleased to sign same.—Yours truly, X.

Cheshire School Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—What do you think of this as an instance of cool cheek? Some time ago, in response to an advertisement, I sent in plans for two small schools to be erected by the Cheshire County Education Committee near Macclesfield. After some two months or so I received my plans back. There was no announcement of the result with them—in fact, nothing whatever. This was about three weeks ago, but I have heard nothing further, nor, so far as I can ascertain, has any other competitor. One would think that a county council, spending public money, could at least afford a penny stamp to let one know the result of a competition on which one had expended some weeks of unremunerative labour. Is not this an argument for registration, which, if it does nothing else, may at least raise our status in the public eye a little?—Yours truly,

LIVERPOOL.

ALPHA.

Fire-resisting Wood for Strong-room Shelves.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—We notice in your issue for November 22nd an answer to an enquiry about fire-resisting wood for shelves in strong-rooms. With regard to your statement that "if the interior of a strong-room became hot enough to scorch the wood of the shelves the papers would be burnt," we desire to say that fire-resisting wood is not only far less conductive of heat than ordinary wood, but is an almost perfect non-conductor. Unless the fire or flame be in absolute contact with every part, and continue in such absolute contact, it would not scorch the wood nor materially raise its temperature. Therefore, the security from any damage to documents is so increased that the use of fire-resisting wood for such a purpose is in every way necessary.

If flames were in contact with a piece of our wood, papers well within a foot would not be scorched.

With regard to your second statement that "there is an especial objection to using wood which has been processed because the chemicals are hygroscopic &c.," we feel you are not cognizant of the qualities of wood treated by our process. Our wood is not hygroscopic, nor does it keep damp, nor has it any tendency to absorb moisture so as to make it in any way injurious to paper, parchments or other materials placed upon it.

In justice to ourselves we shall be glad if you will publish these facts.—Yours truly,

FIRE-RESISTING CORPORATION, LTD.

FULHAM.

A. A. WELSH, Secretary.

[In reply to the above we need only say that hitherto there has been a tendency for treated wood to become hygroscopic, as shown by Professor Woolson in the paper which he read before the last International

Fire Congress. In a few instances where treated wood has been employed iron fittings and nails in contact with it have rusted, and trouble has also arisen from this source in connection with casings of electric bell wires. We are glad to hear, however, that the Fire-Resisting Corporation, Ltd., have successfully overcome the defect. Shelves of strong-rooms should not be in contact with walls; but, assuming that they were, fire-resisting wood would certainly be an advantage. If the temperature rose sufficiently to scorch ordinary wood when the shelves were not in contact with the walls, it would scorch the papers also, being nearly equal throughout the room, in which case there would not be any particular advantage in using treated wood.—Ed. B. J.]

The Lettering Nuisance.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In the "Times" of November 24th a letter appeared under the heading "Kingsway and Aldwych" with the object of suggesting generally to corporations and other landlords, public and private, the advantage that would result from the insertion of covenants in the leases of building sites or buildings under their control imposing reasonable restrictions as to advertising displays (including, of course, all lettering and other devices appealing to the eye) on any part of the exterior. Whether the suggestion will prove fruitful depends upon the backing it gets from those who speak with more authority than that of an honorary secretary of a society.

Architects have a particular interest—may I venture to add that they lie under a special obligation?—in the matter. For if the present tendency goes on unchecked, design must become a minor element in determining the aspect of business thoroughfares.

You will remember that some years ago a memorial signed by a number of London architects was presented to the London County Council urging it to obtain powers of control over spectacular advertising in all cases. In this instance it has the power in its own hands.—Yours truly,

RICHARDSON EVANS,

Hon. Secretary,

National Society for Checking the Abuses of Public Advertising.

The T-Square Club.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Allow me to correct an error on page 316 of your issue for last week. The T-square Club is still in existence; in fact, we are holding a general meeting on Thursday, December 14th, at "The Monaco," Piccadilly Circus, at 5.45 p.m. All communications respecting the Club should be addressed to me at 7, Great James Street, Bedford Row, W.C.—Yours truly,

W. H. WEBBER.

Wren's House not Sold.—The fine old mansion in Botolph Lane, Eastcheap, said to have been occupied by Sir Christopher Wren, was put up for sale at Tokenhouse Yard last week, but, nothing higher than £6,750 being offered, was withdrawn.

The Trowbridge and District Joint Isolation Hospital was opened recently. The architect was Mr. J. Hugh Goodman, of Reading, whose design was selected from among fifty others submitted in competition. Mr. George Moore, of Trowbridge, was the builder, his contract being for £6,934. The hospital provides accommodation for thirty patients, and comprises an administration block, three ward pavilions (heated by Shorland's central stoves), and a block containing the laundry, disinfectant chambers, ambulance, mortuary, &c. Laundry fittings have been supplied by Messrs. G. N. Haden & Sons, of Trowbridge, and sanitary fittings by Mr. W. E. Farrer, of Birmingham.

NOTES ON COMPETITIONS.

Proposed Central Library, Hackney.

THE Council of the Metropolitan Borough of Hackney has issued somewhat tardily its list of replies to competitors' questions in the competition for the proposed central library at Hackney, and the predominant feeling in the minds of all intending competitors after perusing the list must be one of anxiety, if not of disappointment, that no enlightenment has been vouchsafed upon the leading question, which runs: "(1) Although the Council does not bind itself to employ any of the architects whose designs are selected, may it be presumed that it is intended that the author of the first-premiated design shall be appointed, provided there is no valid reason to the contrary?"

In the absence of any official information upon this point it is pleasant to be able to place at the disposal of all who may be interested the result of

A Competitor's Interview with the Town Clerk.

to whom it was pointed out that the question was one which seriously affected all competitors, many of whom would not compete unless they received some definite assurance that their labour was not to be in vain. The town clerk replied that he had no reason to suppose that his Council intended to adopt any but the usual course. This is satisfactory so far as it goes, but it is not sufficient, and competitors should obtain a written confirmation of the Council's intention to act in the customary manner before embarking upon what appears a risky enterprise. There have been too many unsatisfactory results in competitions lately to make any reliance on chance aught but a foolhardy proceeding.

The Question of the Assessor.

A competition has usually been considered "safe" when it has been known that an assessor was to be appointed, other conditions being favourable; but recent experience has shown that even this is not without its risks, and a growing feeling of distrust is becoming evident against any competition the announcement of which is not accompanied by the name of the assessor. It is, therefore, regrettable to read in the list of queries and answers "(3) Has the assessor been appointed; if so, has he been consulted upon the conditions?" "No." True the conditions state that "the designs will be adjudicated upon by an assessor to be nominated by the president of the Royal Institute of British Architects, whose award shall be final and binding," but has the president been approached by the promoters? If so, why did he not appoint an assessor at once and make his appointment conditional upon the conditions being drawn up to the assessor's satisfaction and the publication of his name in those conditions? If not, upon what authority do the promoters make their statement?

Competitors have absolutely no means of knowing whether the gentleman appointed will be one upon whom they will be able to rely. If they are willing to believe that the president cannot err, then let no voice be raised in protest at any future award made under these auspices.

The Question of Fees.

Competitors should also satisfy themselves upon another point in the questions and answers. It is asked "(2) Will the architect appointed be paid in accordance with the schedule of professional practice as to charges of architects drawn up by the Royal Institute of British Architects?"—to which the answer is, "The conditions as to remuneration are set out in paragraph 4 of the particulars." Now, paragraph 4 of the particulars states that "a premium of fifty, thirty, and twenty guineas respectively will, in the

order of their selection, be paid to the authors of the three designs and plans which stand highest in the judgment of the assessor, and these designs will become the absolute property of the Council." This is ominous reading in the face of no guarantee that the successful architect will be employed; and although clause 5 does state what the architect's fees are to be if he is appointed, the question and answer can only be accepted as they are stated, unless a notification is received from the promoters that the answer referring to clause 4 was an error and should have referred to clause 5. With a list of answers so unsatisfactory as these, too much care cannot be observed by competitors before committing their schemes to an irrevocable fate.

An Elgin Competition.

In our issue for November 8th, under the heading of "Two more Unsatisfactory Competitions," it will be recollected that we dealt with the Elgin cemetery extension competition. Our remarks called forth letters from Messrs. Stewart & M'Isaac, the secretaries to the Cemetery Committee, and Mr. John Wittet, their architect, who stated he had acted as assessor. These letters we published in our issue for November 22nd, together with our comments on them.

We are now in a position to throw some further light upon the conduct of this competition, having been able to obtain additional information and a printed copy of the conditions, although the promoters withheld this from us. These conditions contain a number of unimportant details which we do not think it necessary to repeat.

The conditions were badly drawn, but the chief point is that the Cemetery Committee promised to appoint a qualified assessor. This they did in the person of their own architect. The gentleman is doubtless fully qualified, and a very proper person to act as an assessor in the ordinary way, but we hold that the committee should have stated they had this intention.

We have already referred to the fact that the committee's architect says he only reported on the three most likely designs, and that the committee, after careful consideration, unanimously selected the design of Mr. William C. Reid, architect, of Elgin.

On referring to a directory of architects published three or four years ago, we notice that there was a firm of architects at Elgin named Alexander & William Reid & Wittet, of 81, High Street, and from Kelly's "Directory of the Building Trades" for 1902 we find that a firm named Reid & Wittet had offices at the same address, though from a current directory of architects we do not see the same firm in existence. We notice, however, that an architect named W. C. Reid has his address at 8, Culbard Street, and Mr. J. Wittet now has his office at 81, High Street, Elgin.

Plans were returned to competitors with a curt note saying that another plan had been selected, but not mentioning who had been awarded the premium nor the name of the assessor, nor was there any intimation (we now learn) of an exhibition of the designs.

Mr. Wittet's letter to us stated that the object of the committee was "to give local men, as ratepayers, an opportunity of competing, and accordingly, after preparing a memorandum of conditions, advertised the competition in the local papers." One would infer from this that the advertisement was confined to the locality, that is, to the Elgin papers, but we are informed that this was not so, as the advertisement appeared frequently in newspapers in the south of Scotland, while we know as a matter of fact that competitors from other towns at some distance were allowed to compete. If the object was, as stated (and as has been accomplished), to give a job to Elgin competitors

only, the committee should not have advertised other than locally and should have mentioned that designs from Elgin competitors only would be accepted.

It will be apparent from the conditions that the work to be done was so small and unimportant that it was unfair to ask the public to waste time on it.

The Forthcoming Birmingham Competition.

On November 28th a special meeting of the Birmingham City Council was held to consider the proposal for the erection of additional municipal offices and an extension of the art gallery, and by a large majority the General Purposes Committee's recommendation to hold an open competition for the work was adopted. On the suggestion of Messrs. Aston Webb and E. Ingress Bell, consulting architects, sketch plans are first to be sent in, from which six or ten architects will be selected to submit final designs, each receiving an honorarium of 100 guineas. The competitors will be told the cost must not exceed £150,000, and that the buildings must be in reasonable conformity with the buildings on the other side of the street; but apart from that they will have a free hand. It is proposed to set back Edmund Street a little, so as to make it as wide as Congreve Street and Great Charles Street, 60ft., and Margaret Street is to be 50ft. wide. Speaking at last week's meeting Alderman Beale said they could not get the sketch plans before the end of next March, and under the most favourable circumstances they could not select the final design before the end of July. Then time would be required for the preparation of tenders and quantities, so that there would be a bare two years between letting the contract and the time the Council covenanted to have the buildings finished.

R.I.B.A.

New Fellows and Associates.

At a business meeting of the Royal Institute of British Architects held on Monday evening at 9, Conduit Street, W., the following elections took place:—

As Fellows.

(Of London where not otherwise stated.)

H. J. C. Cordeaux (East London, Cape Colony)	A. W. Moore
G. A. H. Dickson (Johannesburg)	G. E. Nield
H. J. Helsdon	J. Owen (Menai Bridge)
A. R. Hennell	A. Rigby (Douglas, I.M.)
J. N. Horsfield (Kingston-on-Thames)	Percy Robinson (Leeds)
W. G. Hunt (N.S.W.)	F. Rowntree
H. C. Kent (Sydney)	J. D. Swanson (Kirkcaldy)
	E. S. Underwood
	A. F. Watson (Sheffield)
	E. A. E. Woodrow

As Associates.

(Of London where not otherwise stated.)

L. N. Barrett	J. H. Markham
A. A. Carder (Clapham Common)	Leslie T. Moore (Great Yarmouth)
J. C. Cook (Bloemfontein)	V. Myer
O. S. Doll (Brighton)	J. J. S. Naylor
G. L. Elkington	Harry Prince
G. F. Ely (Liverpool)	E. Reid (Sunderland)
C. L. Fleming-Williams	Sydney Searle
J. L. Fouracre (Plymouth)	Noel Thomas
L. U. Grace	J. W. Walker
W. C. Le Maître	W. E. Watson

The results of the November examinations were announced.

It was set down on the agenda that Mr. Horace T. Bonner should move "That neither the president nor the council, nor either of them, shall approach the promoters of any competition with the object of their nominating competitors; nor shall the president or council appoint any professional assessor in any competition, unless requested to do so by the promoters of such competition." This motion, however, was withdrawn.

Mr. William Woodward, Mr. Gruning and other speakers discussed some clauses of the London Building Acts Amendment Bill. The meeting then terminated.

Keystones.

Blast Furnaces are proposed to be built at Swansea Docks by a company with a capital of £100,000.

A Chapel at Taunton School is to be built from designs by Mr. Frank Wills, F.R.I.B.A. It is the gift of Sir W. H. Wills.

A Statue of Whistler by Rodin has been commissioned by the International Society of Sculptors, Painters and Engravers. It is to be erected in Paris.

A Roman Bath, 6ft. 3ins. by 10ft. 6ins. inside, and weighing about 7 tons, has been unearthed during excavations for a fire-station in Cannon Street, London.

Several Cheap Cottage Exhibitions are to be held in 1907 under the organization of the National Housing Reform Council. The £200 cottage is to be taken as the standard.

Change of Address.—Messrs. Gregory & Co., masons, brickbuilders and contractors, have removed from 6, Overdale Gardens to more convenient premises at 35, Stockwell Place, Glasgow.

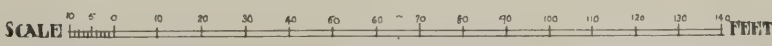
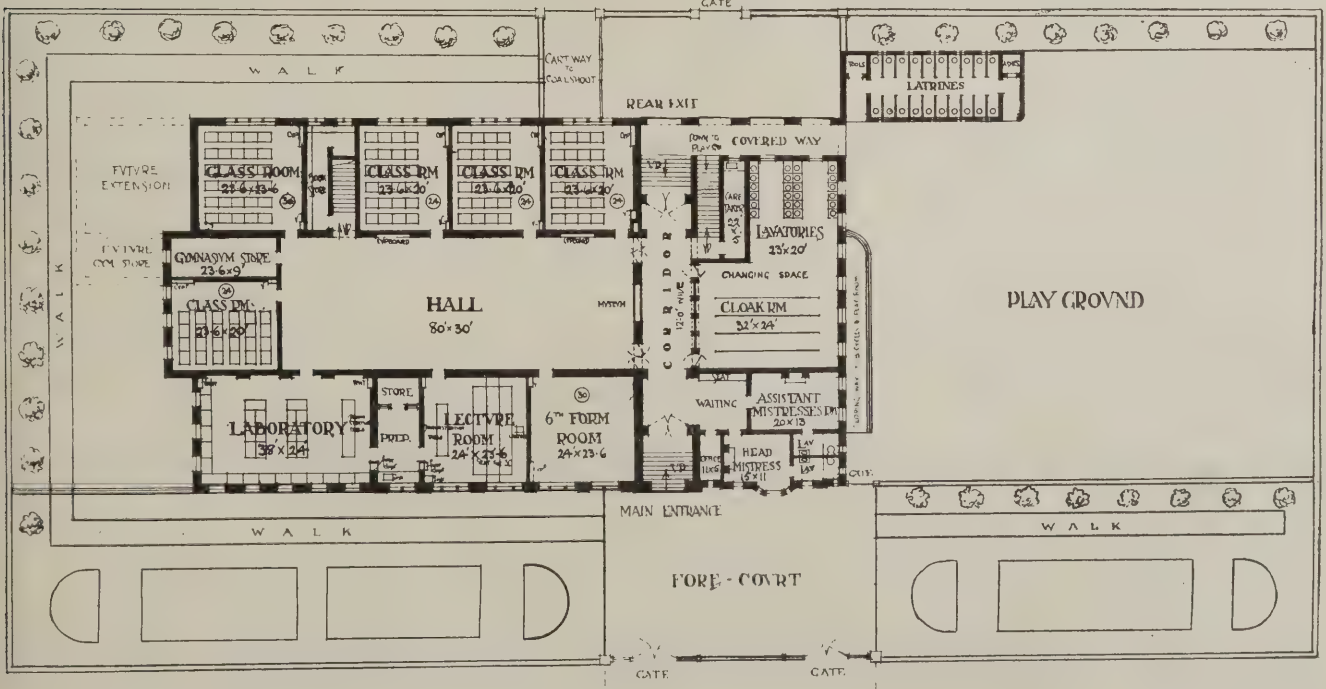
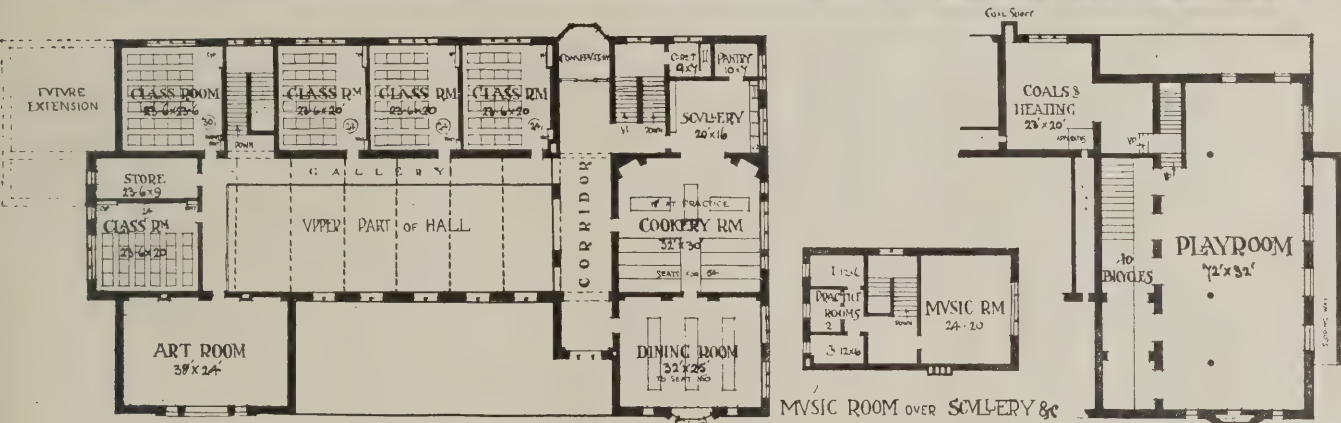
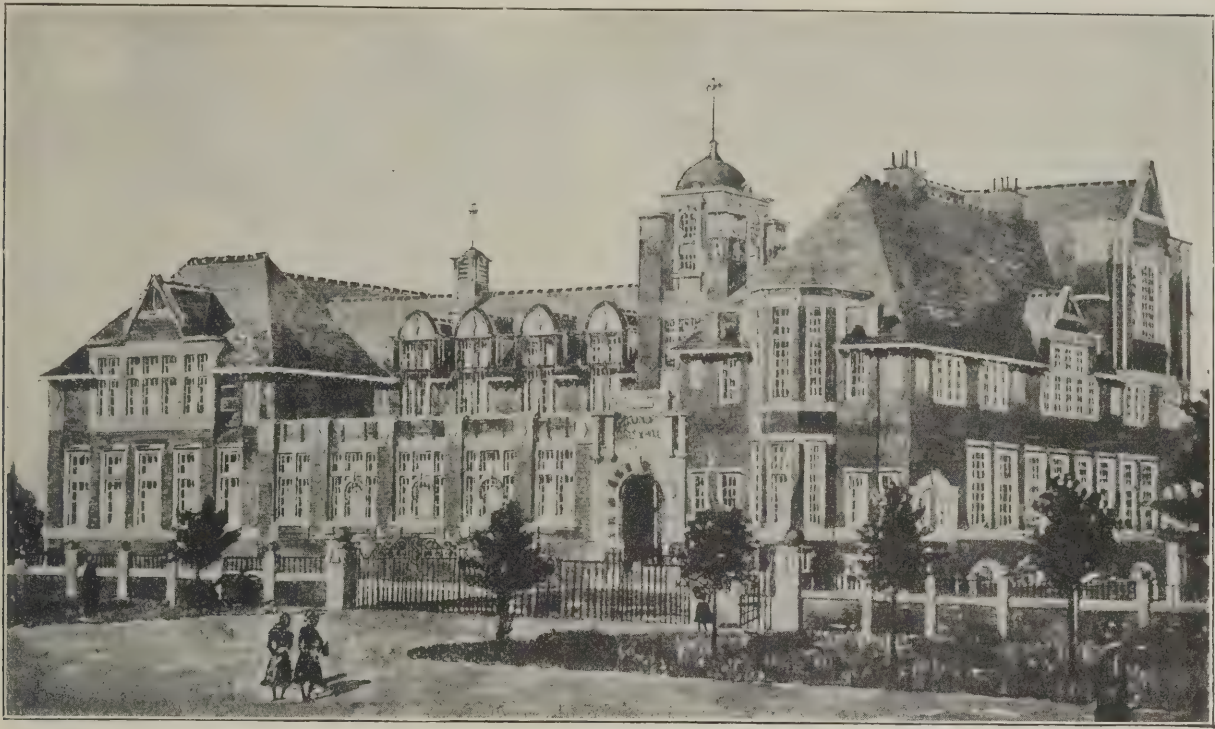
The Restoration of St. Bartholomew's-the-Great, Smithfield, which has been carried out by Sir Aston Webb, R.A., reached its final stage when on Saturday last the Bishop of London reopened and dedicated three bays of the east cloister—once used as a stable. A considerable amount of Norman and Perpendicular work remains visible.

At the Gunnery School on Whale Island a large new block has been recently built for the accommodation of the sub-lieutenants undergoing gunnery and torpedo courses. This building, which is of two storeys, with a concrete foundation, is 256ft. long, 27ft. wide and 34ft. high. It is of 215,000 cub. ft. contents, and comprises 100 bedrooms and the requisite bathrooms (mess-room and other portions additional adjoining). The contractors for the work were Messrs. Patman & Fotheringham, of London, who completed the building in the short space of six months.

New Workhouse and Infirmary at Hammersmith.—On Friday last Princess Henry of Battenberg opened the new workhouse and infirmary buildings which have been erected by the Hammersmith Board of Guardians at Ducane Road, Wormwood Scrubbs, from designs by Messrs. Giles, Gough & Trollope. The infirmary will accommodate 330 sick persons and the workhouse 428 destitute poor. The infirmary blocks are divided into wards, each of which contains twenty-four beds, in addition to which there are the necessary administrative departments, and a separate nurses' home. The cost of the buildings has been £207,000, exclusive of £14,400 for the site (about 14½ acres). A feature of the workhouse is the provision of comfortable quarters for aged married couples, which will prevent their separation in the workhouse.

PRESTON SCHOOL COMPETITION.

ON the opposite page we publish the first-premiated design in the competition for a secondary school for girls at Preston, by Messrs. Woolfall & Eccles, of Liverpool. The plans show the accommodation provided. The conditions required the building and boundary walls "to be faced with first-quality Accrington or other approved bricks," and all dressings to be of stone, sparingly used. The roofs were to be covered with the best North-country slates, and easy access was required to be provided thereto. The limit of cost was placed at £9,000. In our next issue we hope to give a few further particulars from the architects.



FIRST-PREMIATED DESIGN FOR SECONDARY SCHOOL FOR GIRLS AT PRESTON. WOOLFALL AND ECCLES ARCHITECTS.

Law Cases.

Disregarding the By-laws.—At the Darlington Police Court last week Samuel Scott, a builder, was fined £10 and costs for placing joists too far apart and committing other breaches of the by-laws in some cottages he was building in Thompson Street. The joists had been placed at an average distance apart of 17½ ins. after defendant had been cautioned by the borough surveyor and told they should be 15 ins. apart only. Concrete laid down was only 2 ins. thick instead of 6 ins., and an inspection chamber had not been provided.—At Falkirk Sheriff Court last week a builder named Abercrombie was summoned (1) for not giving notice to the local authority of the time at which the branch drains of a building which he had erected were to be tested, and covering up the drains without giving such notice, (2) for not constructing the drains properly, (3) for not ventilating the drains, and (4) for not providing a water-tight connection with the soil-pipe. For each of the first three offences a fine of £2 10s. was imposed, and £1 for the fourth—in all £8 10s.

Architect's Fees for Extras.—In the Lord Mayor's Court last week Mr. M. Garrood, architect, of London, sued Mr. Harper for £46 15s. for services rendered in connection with certain building operations at Hendon. The plaintiff's case was that he was employed as an architect to prepare drawings and tracings for the erection of two houses under a speculative building agreement. While the buildings were being proceeded with, the defendant took over the interest in the work. Under the original arrangement the fees were to be seven guineas per house. It became necessary, however, to get rid of the builder. The defendant then arranged to finish the premises, and the plaintiff was engaged to ascertain what was required. That was extra work not included in the original arrangement. The Recorder said that the case should be referred, as many items had to be enquired into. For the defendant it was suggested that the sum of £6 was sufficient to pay for the extra work. The case was eventually referred to the assistant judge to ascertain the amount due to the plaintiff.

Builders' Notes.

A new Branch of the National Association of Master House-Painters and Decorators is to be formed at Ramsgate and Broadstairs.

Scarborough Master-Builders' Association.—At the recent annual meeting of this Association Mr. R. H. Carr, who had previously acted for seven years as secretary and two as vice-president, was unanimously elected president.

A Slump in Building is recorded in the annual report of the Birmingham City Surveyor. During the past year the total number of plans submitted to the Corporation for approval was only 1,061, as compared with 1,563 in the previous year and 2,252 in 1902-3.

Manchester New Infirmary: Satisfactory Progress.—At last week's meeting of the Board of the Royal Manchester Infirmary the joint architects of the new infirmary (Messrs. Edwin T. Hall, of London, and John Brooke, of Manchester) presented a report on the progress of the building. They stated that the foundations contract was signed in May, and the work at once energetically proceeded with. In August the supplemental contract was settled to carry up all the buildings to the level of the ground floor. The present condition of the buildings was very satisfactory.

A new Suburb for Newcastle.—An extensive building scheme, providing for the erection of some hundreds of houses, will shortly be projected in the north-west of Newcastle-on-Tyne. The extension is part of the general plan for embracing the 90 acres of pasture land in the building area of the Fenham Estate Co.

Houses of Concrete Blocks.—At Walton-on-Thames, on the Felcott Estate, a number of houses are proposed to be built with concrete blocks made on the spot by the Cavity Ventilating Building Block Syndicate, Ltd., working the patent of Mr. J. G. Sidder, consulting engineer, of Brockley. The blocks are in two sections, connected with dovetailed dowels.

Winter Work for Painters and Decorators.—The operative painters and decorators of Saltley, Birmingham, have passed a resolution urging the City Council and all other local governing bodies to have all necessary inside cleaning and painting of schools, markets, baths and other public buildings that would be done next spring or summer put into operation at once to relieve the prevalent distress.

The Birmingham Builders' Exchange and Exhibition.—The catalogue of the newly formed builders' exchange and exhibition at Birmingham has just been issued. The building is in High Street, within three minutes of New Street Station, and in addition to providing an exchange hall where members can meet to conduct business, there are exhibition halls in which a representative collection of builders' materials of all kinds, both constructive and decorative, is displayed, thus affording an excellent opportunity for architects and builders to show their clients what is available, and also to keep themselves personally informed of everything that is up-to-date. We notice that the catalogue includes about half a dozen little articles, on "The Making of a Building," "Architecture," "Sanitation," &c. These are futile effusions, and seem to us to be quite out of place in what is essentially a business list.

Coming Events.

Wednesday, December 6.

QUANTITY SURVEYORS' ASSOCIATION.—Mr. F. B. Hollis on "Some Thoughts on the Quantity Surveyor, and his relation to the Building Owner, the Architect and the Builder," at 7 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. E. Macrae on "A Tour in Belgium," at 8 p.m.
ARCHITECTURAL ASSOCIATION (Discussion Section).—Mr. W. A. Forsyth on "The Conversion of the Jerry-builder," at 7.30 p.m.

Thursday, December 7.

CHEMICAL SOCIETY.—Meeting at 8.30 p.m.

Friday, December 8.

JUNIOR INSTITUTION OF ENGINEERS.—Annual Dinner.

ARCHITECTURAL ASSOCIATION.—President's "At Home" at 8.30 p.m.

NORTHAMPTON INSTITUTE.—Distribution of Prizes by Sir William Preece, and Conversazione, at 8 p.m.

Saturday, December 9.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—General Meeting at 2 p.m.

Monday, December 11.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 4 p.m.

Tuesday, December 12.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Lecture by Mr. T. Baird at 8 p.m.

Wednesday, December 13.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. T. Preston on "Italian Art and Travel," at 7.30 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. L. G. Mouchel on "Ferro-concrete Construction," at 8 p.m.

T-SQUARE CLUB.—General Meeting, Café Monaco, at 5.45 p.m.

Friday, December 15.

INSTITUTION OF MECHANICAL ENGINEERS.—Meeting at 8 p.m. Discussion on Alloys. Mr. E. G. Izod on "The Behaviour of Materials of Construction under Pure Shear."

ARCHITECTURAL ASSOCIATION.—Mr. W. H. Bidlake on "Church Towers and Spires," at 7.30 p.m.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. J. A. Gutch on "The Homes of Queen Elizabeth's Courtiers," at 6.45 p.m.

JUNIOR INSTITUTION OF ENGINEERS.—Prof. J. T. Morris, M.I.E.E., on "Electrical Mains for Power Transmission," at 8 p.m.

Current Market Prices

FORAGE.

		£	s.	d.	£	s.	d.
Beans	... ..	per qr.	1	13	0	1	15
Clover, best	... ..	per load	3	12	0	4	0
Hay, good	... ..	do.	3	6	0	3	10
Sainfoin mixture	... ..	do.	3	7	0	3	15
Straw	... ..	do.	1	8	0	1	14

OILS AND PAINTS.

Castor Oil, French	... ..	per cwt.	1	10	0	1	2
Colza Oil, English	... ..	do.	1	4	3	—	—
Copperas	... ..	per ton	2	0	0	—	—
Lard Oil	... ..	per cwt.	2	15	0	2	17
Lead, white, ground, carbonate	... ..	per ton	16	0	0	—	—
Do. red	... ..	do.	15	0	0	0	19
Linseed Oil, barrels	... ..	per cwt.	0	17	9	—	—
Petroleum, American	... ..	per gal.	0	0	7½	0	0
Do. Russian	... ..	do.	0	0	6½	0	0
Pitch	... ..	per barrel	0	8	0	—	—
Shellac, orange	... ..	per cwt.	9	0	0	9	2
Soda, crystals	... ..	per ton	3	2	6	3	5
Tallow, Town	... ..	per cwt.	1	6	9	1	7
Tar, Stockholm	... ..	per barrel	1	5	0	—	—
Turpentine	... ..	per cwt.	2	5	3	—	—

METALS.

Copper, sheet, strong	... ..	per ton	91	0	0	—	—
Iron, Staffs., bar	... ..	do.	6	15	0	8	10
Do. Galvanized Corrugated sheet	... ..	do.	12	0	0	12	5
Lead, pig, Soft Foreign	... ..	do.	16	5	0	—	—
Do. do. English common brands	... ..	do.	16	10	0	—	—
Do. sheet English, 3lb. per sq. ft. and upwards	... ..	do.	17	0	0	—	—
Do. pipe	... ..	do.	17	10	0	—	—
Nails, cut clasp, 3in. to 6in.	... ..	do.	9	5	0	—	—
Do. floor brads	... ..	do.	9	0	0	—	—
Steel, Staffs., Girders and Angles	... ..	do.	6	15	0	7	5
Do. do. Mild bars	... ..	do.	7	5	0	7	10
Tin, Foreign	... ..	do.	154	0	0	154	0
Do. English ingots	... ..	do.	161	10	0	162	0
Zinc, sheets, Silesian	... ..	do.	31	7	6	—	—
Do. do. Vieille Montagne	... ..	do.	31	10	0	—	—
Do. Spelter	... ..	do.	28	12	6	28	17

TIMBER.

SOFT WOODS.

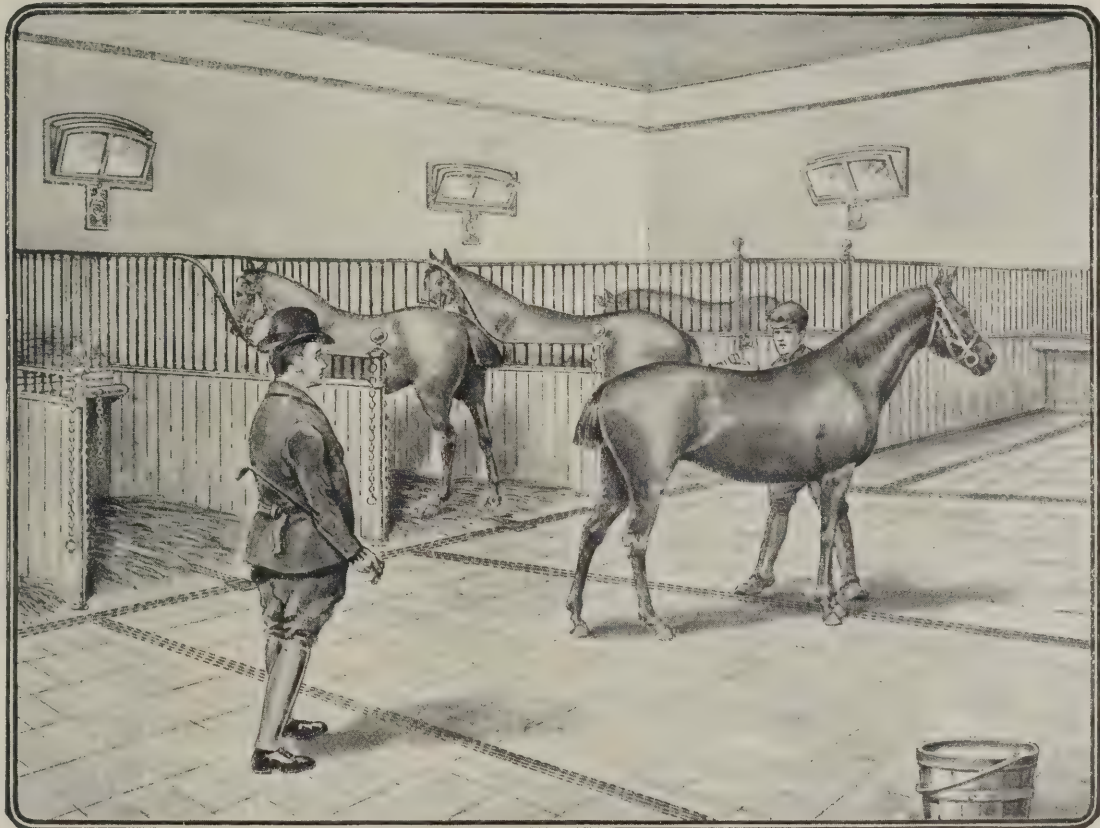
Fir, Dantzic and Memel	... ..	per load	2	15	0	5	0
Pine, Quebec, Yellow	... ..	do.	4	2	6	7	10
Do. Pitch, American	... ..	do.	3	1	0	5	0
Laths, log, Dantzic	... ..	per cu. fath.	4	0	0	6	0
Deals, Archangel, White, 1st, 3 x 11	... ..	per std.	14	0	0	—	—
Do. do. do. 1st, 3 x 9	... ..	do.	12	5	0	—	—
Do. do. do. 2nd, 3 x 9	... ..	do.	10	15	0	—	—
Do. Montreal, Red Pine, 2nd, 3 x 9	... ..	do.	10	15	0	—	—
Do. St. John, Bright Spruce, unsorted 1st, 2nd & 3rd, 3 x 9	... ..	do.	9	0	0	—	—
Do. Kovda, Yellow, 3rd, 3 x 9	... ..	do.	10	15	0	—	—
Do. Nederkalix, Yellow, 1st, 3 x 9	... ..	do.	12	0	0	—	—
Do. Bjorneborg, Yellow, 3rd, 3 x 8	... ..	do.	8	10	0	—	—
Do. Transvaal, Yellow, 1st & 2nd, 3 x 7	... ..	do.	8	0	0	—	—
Do. Ramvik, Yellow, 1st, 2½ x 7	... ..	do.	10	0	0	—	—
Do. St. Petersburg, Yellow, Unsorted, 2½ x 7	... ..	do.	8	10	0	—	—
Do. do. do. do. 2½ x 7	... ..	do.	8	15	0	—	—
Do. do. do. do. 1st and 2nd, 2½ x 7	... ..	do.	8	5	0	—	—
Do. Batskarsnas, Yellow, 3rd, 2½ x 7	... ..	do.	8	5	0	—	—
Do. Sundswall, White, Inferior, 5th, 2½ x 7	... ..	do.	7	10	0	—	—
Battens, all kinds	... ..	do.	6	15	0	13	0
Flooring Boards rin. prepared, 1st.	... ..	per square	0	9	3	0	14
Do. 2nd	... ..	do.	0	8	3	0	9
Do. 3rd, &c.	... ..	do.	0	7	3	0	8

HARD WOODS.

Ash, Quebec	... ..	per load	3	15	0	7	10
Birch, New Brunswick	... ..	do.	2	5	0	4	10
Do. Quebec do.	... ..	do.	2	10	0	4	15
Box, Turkey	... ..	per ton	7	0	0	20	0
Cedar, Cuba	... ..	per ft. sup.	0	0	3	0	4
Do. Honduras	... ..	do.	0	0	6½	—	—
Do. Tobasco	... ..	do.	0	0	5	—	—
Elm, Quebec	... ..	per load	4	0	0	8	5
Jarrah, plank	... ..	per ft. cu.	0	2	6	0	3
Mahogany, Average Price for Cargo, Honduras	... ..	per ft. sup.	0	0	4½	0	0
Do. Tobasco	... ..	do.	0	0	3½	0	0
Do. Cuba	... ..	do.	0	0	3½	—	—
Do. African	... ..	do.	0	0	3½	—	—
Oak, Wainscot	... ..	per log.	3	10	0	7	5
Teak, Indian, logs	... ..	per load	9	5	0	19	0
Do. do. planks	do.	12	15	0	20	0
Whitewood, American, logs	per ft. cu.	0	1	3	0	1
Do. do. planks and boards	do.	0	1	3	0	3

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Electrical Notes.

Mr. Swinburne on Comparisons.

In the course of a paper read recently to students of the Institution of Electrical Engineers at Manchester Mr. James Swinburne, the well-known electrical engineer, referred to the comparative cost of different artificial illuminants, and made some interesting statements. He said that, taking the cost of electrical energy at 4d. per Board of Trade unit, an ordinary glow lamp would give nearly 800 candle-hours for 1s., while a flame arc lamp with energy at 3d. would give 14,000 candle-hours. It was to be remembered, however, that the 1s. was all spent on energy, nothing being allowed for the renewal of lamps, interest on fittings, meter rents, interest on lamps and cost of carbons and labour. For 1s. with energy at 5d., one got about the same light as with a flat-flame gas-burner and gas at 4s. per 1,000 cub. ft. But the ordinary oil lamp, with paraffin at 8d. per gallon, was far more economical, and even that was out of the running with acetylene. The great fight between electricity and gas had been fought with flat-flamed burners and carbon lamps, and there had been much discussion. He had been accused of a strong partiality for electric light; but he felt impartial: he really did not know which was the worse! The gas-mantle made an enormous difference and brought gas, say, 3s. ahead of everything but the mercury and flame arcs at, say, 4½d. per unit. The flame arc was essentially for large lights, while the mantle lights could be made quite small. The comparison was, of course, only for the same money paid for gas or energy. To make a real comparison, many other factors had to be taken into account. For one thing, there was the interest on the mercury lamp; then its colour

was not good; and if carbons were added, then the efficiency went down. On the other side, however, one had to estimate the cost of the mantles and the trouble arising from breakages, stopping up of the jets, &c. But even then it was clear that the mantle had a large margin of economy over house lamps such as the Nernst, the metal and the carbon incandescents. For outside use, however, and for large buildings the flame arc seemed to have plenty of margin over the mantle. Nevertheless, so far as interiors were concerned it was not to be forgotten that gas spoilt decorations, and consequently there was the extra cost of re-decorating to be set against it: and gas blackened ceilings and destroyed paint as well; so that the extra cost of decoration might be as heavy as the whole cost of the electric light, in which case it would not pay to employ gas at any price. "This argument annoys the gas industry; so it is sound and good."

Energy from the Victoria Falls.

The African Concession Syndicate has been in consultation with the leading American and Continental engineers and experts on the subject of the transmission of power from the Victoria Falls to the Witwatersrand. These authorities have unanimously expressed the opinion that the scheme is not only quite feasible, but would be commercially successful, especially as the climate of South Africa is one of the most suitable in the world for the transmission of power. There is no ice in the rivers to interfere with the working of the turbines and no snow to break down the transmission lines. The extreme dryness of the climate is also greatly in favour of the project. With reference to statements that the volume of water in the Falls is not sufficient to produce the necessary power, it is pointed out that even in the driest season yet experienced there is sufficient water to produce 500,000-h.p., while at present the Rand

only consumes 150,000-h.p. At the Falls there is an available head of about 330ft., and if more than 500,000-h.p. were needed it could easily be obtained by cutting a canal fifteen to twenty miles in length to a point lower down, where there would be a head of 1,000ft., sufficient to produce 1,000,000-h.p.

German Competition.

Germany is always an industrial competitor of ours, but in the electrical trade she is perhaps more formidable than in any other. This matter was referred to by Sir Joseph Lawrence, M.P., when speaking recently at a meeting at Westminster. He then stated, on the authority of the Prussian Minister of Commerce, that there were 450 syndicates in Germany, mostly connected with the metal industries, mines, chemicals and textiles. These associations, or cartels, in many cases made to such of their customers as wished to export a premium equal to the difference between the price they could get in Germany and the lower price at which they sold to outsiders. Since 1902 he knew of instances where many of these powerful firms, especially in the electrical engineering trades, again combined among themselves. The capital represented by these latest combinations was very formidable, and it was almost impossible for English manufacturers, in such trades as electrical engineering, to break through the cast-iron arrangement by which these German trusts not only kept the command of their own market but were becoming an almost irresistible power in neutral markets. It was a poor look-out for English electrical manufacturing firms who had to combat a threefold disadvantage, namely, Customs dues, patent laws and cartels. All the education and skill in the world, said Sir Joseph, could not alone overcome these barriers. Their effect was felt in the lessened opportunities of work for our own workpeople.



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DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:			
Dec. 7	Sedburgh—Enlarging, &c....	—	Stephen Shaw, F.R.I.B.A., Architect, Kendal.
" 8	Broadlane—Church Renovation ..	—	Sampson Hill, Architect, Green Lane, Redruth.
" 8	Maesycwmm—Houses ..	—	J. Francis Jones, Architect, 15 Brynmorlais Street, Pen-y-darren.
" 8	Pinged—Conveniences, Boundary Walls, &c.	Education Committee ..	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Llechtyed—Repairs to School ..	Education Committee ..	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Alltwales—School Alterations, &c.	Education Committee ..	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Pontyveates—Repairs and Ventilation	Education Committee ..	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Bardfield Saling—School ..	Education Committee ..	W. D. Jenkins, County Education Architect, Shirehall, Carmarthen.
" 8	Great Bardfield—Alterations to School	Education Committee ..	F. Whitmore, County Architect, Duke Street, Chelmsford.
" 8	Peckham, S.E.—Sorting-office ..	H.M. Office of Works ..	F. Whitmore, County Architect, Duke Street, Chelmsford.
" 9	Tottenham—School ..	Education Committee ..	J. Wager, H.M. Office of Works, Westminster, S.W.
" 9	Heston—Alterations to Schools ..	Education Committee ..	G. E. T. Laurence, Architect, 22 Buckingham Street, Adelphi, W.C.
" 9	Weston-super-Mare—Alterations ..	Messrs. George ..	A. Lancelot Lang, Architect, Council House, Hounslow.
" 9	Watering—Villas ..	—	Hans Price & W. Jane, Architects, Weston-super-Mare.
" 11	Walsall—School ..	Education Committee ..	J. Mutton, Architect, Charlton, St. Austell.
" 11	Lockingate—Classroom, &c.	Education Committee ..	Bailey & McConnell, Architects, Bridge Street, Walsall.
" 11	Barming Heath—Connecting Covered-way, &c.	County Asylums Committee ..	B. C. Andrew, Architect, Osidick's Court, St. Austell.
" 11	Acton—Magistrates' Court ..	County Council ..	W. J. Jennings, Architect, 4 St. Margaret's Street, Canterbury.
" 11	Brentford—Additions at Town Hall	County Council ..	H. T. Wakelam, County Architect, Middlesex Guildhall, Westminster.
" 12	Barnton—School ..	Education Committee ..	H. T. Wakelam, County Architect, Middlesex Guildhall, Westminster.
" 12	Magheracotton—Cottages ..	Rural District Council ..	H. Beswick, County Architect, Newgate Street, Chester.
" 15	Preston—Farmhouse ..	Corporation ..	J. E. Sharkey, Clerk, District Council, Strabane.
" 15	Bromley—Convenience ..	County Council ..	Borough Surveyor, Town Hall, Preston.
" 16	Burntwood—School ..	Education Committee ..	Superintending Architect's Department, 15 Pall Mall East, S.W.
" 19	Kirton—School ..	Managers ..	Education Offices, Stafford.
" 20	Boughton Monchelsea—School Enlargement	Education Committee ..	J. Rowell, Architect, Church Lane, Boston.
" 30	Docking—Repairs ..	Guardians ..	Ruck & Smith, Architects, 85 Week Street, Maidstone.
1906.			J. Morris, Surveyor, Dorset House, Heatham.
Jan. 9	Bungay—School ..	Education Committee ..	A. Pells, Architect, Beccles, Suffolk.
" 10	Southsea—Pier Extension...	Pier Company ..	A. H. Bone, Engineer, 148 High Street, Portsmouth.
ENGINEERING:			
Dec. 7	Aberdeen—Heating ..	Northern Co-operative Co. ..	Secretary, Northern Co-operative Co., Aberdeen.
" 7	Southgate—Bridge Works ..	County Council ..	H. S. Wakelam, County Engineer, Middlesex Guildhall, S.W.
" 8	Bristol—Fender Chains ..	Docks Committee ..	W. W. Squire, Engineer, Cumberland Road, Bristol.
" 8	Cwmbach and Five Roads—Sinking Wells	Education Committee ..	W. D. Jenkins, County Architect, Shirehall, Carmarthen.
" 9	London, E.C.—Deepening Channel	Conservators ..	R. Philipson, Secretary, Thames Conservancy Office, Victoria Embankment, E.C.
" 9	Ramsgate—Condensers, &c.	Gas and Water Committee ..	T. N. Ritson, Engineer, Gas and Water Offices, Ramsgate.
" 11	Dundalk—Reservoir, &c.	Rural District Council ..	Clerk, Rural District Council Office, Dunkalk.
" 11	Grimsby—Culverting ..	Corporation ..	H. Gilbert Whyatt, Borough Engineer, Town Hall Square, Grimsby.
" 11	Basingstoke—Pumping Machinery	Corporation ..	F. Reginald Phipps, Waterworks Engineer, Town Hall, Basingstoke.
" 12	Newcastle-upon-Tyne—Culvert ..	Corporation ..	City Engineer's Office, Town Hall, Newcastle-upon-Tyne.
" 18	Glasgow—Crane, &c.	Trustees ..	G. H. Baxter, Engineer, 16 Robertson Street, Glasgow.
1906.			
Jan. 9	Auckland—Wharf, &c.	Harbour Board ..	W. & A. McArthur, 150 Leadenhall Street, London, E.C.
May 1	Talcahuano, Chili—Dock ..	—	Dirección de Material, Valparaiso.
IRON AND STEEL:			
Dec. 11	London, E.C.—Steel Tyres ..	Southern Mahratta Railway Co. ..	Southern Mahratta Railway Co., 46 Queen Anne's Gate, S.W.
" 11	London, N.W.—Roof ..	Borough Council ..	Borough Engineer, St. Pancras Town Hall, Pancras Road, N.W.
" 11	Halifax—Pipes ..	Corporation ..	G. H. Hill & Sons, C.E., 3 Victoria Street, Westminster.
" 14	Bradfield—Fencing ..	Education Committee ..	F. Whitmore, County Architect, 73 Duke Street, Chelmsford.
" 15	Christiania—Plates ..	Norwegian State Railway ..	Commercial Intelligence Branch, Board of Trade, 73 Basinghall Street.
PAINTING AND PLUMBING:			
Dec. 11	Birkenhead—Painting ..	Corporation ..	C. Brownridge, Borough Engineer, Town Hall, Birkenhead.
" 11	Grimsby—Ventilating Shafts ..	Corporation ..	H. Gilbert Whyatt, Borough Engineer, Town Hall, Grimsby.
" 12	Crossness—Painting ..	London County Council ..	Maurice Fitzmaurice, Chief Engineer, County Hall, Spring Gardens.
ROADS AND CARTAGE:			
Dec. 7	Leeds—Paving and Flagging ..	Corporation ..	City Engineer's Office, Municipal Buildings, Leeds.
" 7	Porth—Repaving ..	Urban District Council ..	W. J. Jones, Surveyor, Public Offices, Pentre, Wales.
" 7	Dinas—Street Improvement Works	Urban District Council ..	W. J. Jones, Surveyor, Public Offices, Pentre, Wales.
" 7	Southend-on-Sea—Making-up ..	Corporation ..	C. J. Eford, Borough Surveyor, Town Hall, Southend.
" 8	Brynamman and Cwmbach—Paving, Metalling, &c.	Education Committee ..	W. D. Jenkins, Education Architect, Shirehall, Carmarthen.
" 9	Newcastle-on-Tyne—Stone, &c.	County Council ..	County Surveyor, Moot Hall, Newcastle-on-Tyne.
" 11	Southampton—Private Street Works	Corporation ..	J. A. Crowther, Borough Engineer, Municipal Offices, Southampton.
" 11	Leicester—Granite ..	Corporation ..	W. H. Chowins, Manor House, Burnham, Somerset.
" 11	Burnham—Stone and Gravel ..	Urban District Council ..	G. Eaton-Shore, Borough Surveyor, Municipal Offices, Crewe.
" 11	Crewe—Street-making ..	Corporation ..	Engineer to the Corporation, Guildhall, E.C.
" 12	London, E.—Paving ..	Corporation ..	T. J. Trowsdale, Surveyor, Council Offices, Annfield Plain.
" 12	Annfield Plain—Street Works ..	Urban District Council ..	County Surveyor, Maidstone, Kent.
" 15	Maidstone—Materials ..	County Council ..	S. Slater Grimley, Engineer, Council Offices, Hendon, N.W.
" 18	Hendon—Road Widening, &c.	Urban District Council ..	
SANITARY:			
Dec. 8	London, W.—Removal of Refuse, &c.	Borough Council ..	J. Wilson, Town Clerk, Town Hall, Marylebone Lane, Oxford St., W.
" 15	Sunbury-on-Thames—Sewage Mains, &c.	Urban District Council ..	A. F. Coales, Surveyor, Council Offices, Sunbury-on-Thames.
" 18	Hendon—Pipe-sewer ..	Urban District Council ..	S. Slater Grimley, Engineer, Council Offices, Hendon, N.W.
" 24	Alderley Edge—Catchpit Gulleys, &c.	Urban District Council ..	J. Newton, Son & Bayley, Engineers, 19 Cooper Street, Manchester.
1906.			
Jan. 4	Rishton—Sewage-disposal Works ..	Urban District Council ..	C. J. Lomax, Engineer, 37 Moss Street, Manchester.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	DEPOSIT REQUIRED FOR CONDITIONS, &c.	FROM WHOM PARTICULARS MAY BE OBTAINED.
1906.				
Jan. 31	Hackney—Library ..	50, 30 and 20 guineas	£1 1s.	W. A. Williams, Town Clerk, Town Hall, Hackney.

Appointments Wanted.

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ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT (23), seeks situation. London experience; good draughtsman, detail and small scale drawings, five years' general experience; good references; moderate salary.—B. A. E., "Glebeside," Preston Park, Brighton. 1512

ARCHITECT and ENGINEER'S ASSISTANT, age 26, desires ENGAGEMENT; 11 yrs. exp.; good draughtsman, surveying, levelling, quantities, supervision of works. Salary, £3.—RICHARD P. BLAKLEY, 4, Zion Terrace, Sunderland. 1498

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YORK Stone Sills, Steps, Templates, and other worked stone cheap. Send for price list.—KELLY & Co., Stone Merchants, Mill Hill, N.W., and Kilburn, N.W.

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THE LONDON DRAWING & TRACING OFFICE, (Est'd. 1883.) 98, Gray's Inn Road, W.C. (Adjoining Holborn Town Hall.)
 Telephone, No. 1011 HOLBORN. Manager—JOHN B. THORP. Telegrams: "DIVIDITORE," LONDON

Notice to Advertisers.

"We wish to say that our advertisement in your valuable paper has brought us a large number of new customers and still increasing. We have now opened a Railway Depot to deal with the Stone trade."

The above is an extract from a letter received on the 27th November last from a firm who have regularly advertised in the "Builders' Journal" for the past two years, and which proves in unmistakable fashion the unequalled value of this Journal to Advertisers.

Educational.

R.I.B.A., SOCIETY OF ARCHITECTS AND CIVIL SERVICE TECHNICAL EXAMINATIONS, preparation by correspondence or residence. 29 first places.—G. A. T. MIDDLETON, 19, Craven Street, Strand.

QUANTITIES.—A course of Correspondence Lectures in this subject (on the London system) is now ready. Also Lectures in Estimating.—For particulars apply Box 632, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

R.I.B.A. EXAMS.—Personal and Correspondence tuition; courses of any duration. Apply for Syllabus to Mr. A. G. BOND, B.A., Oxon., A.R.I.B.A., 115, Gower Street London, W.C. (late Howgate and Bond).

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Can you Design your own Steelwork? Do you know how to properly proportion your columns, stanchions, and girders? We guarantee to teach you how to do this in a few lessons by our System of Correspondence Tuition in Architectural Steelwork.—Apply to us for free Booklet (4th edition), MIDLAND ENGINEERING BUREAU, STRAND, DERBY.

PRACTICAL DESIGNING OF STEEL CONSTRUCTIONAL WORK taught by Correspondence, individually or in classes. Elementary and advanced courses arranged for Architects, Engineers, &c. Write for Prospectus B., EMBANKMENT ENGINEERING INSTITUTE, 156, Temple Chambers, Temple Avenue, E.C.

EMPLOYMENT REGISTER.

Too late for Classification.

- 1526.—GENERAL FOREMAN (45); varied exp., carpenter and joiner; 9 yrs. last job.
- 1527.—ARCHITECTURAL DRAUGHTSMAN (28); thorough knowledge of Gothic and Renaissance detail; specimen drawings and references.
- 1528.—GENERAL FOREMAN OR WORKS MANAGER (40); varied exp., levelling, setting out, details, &c. Town or country.
- 1529.—JOINER; used to good shop; knowledge of stairs. London (in or near) preferred.
- 1531.—DRAUGHTSMAN; black and white drawings, perspectives, &c., executed. Samples submitted.

See p. xx for the Employment Register.

NOTICE TO OUR SUBSCRIBERS.

THE INDEX OF "THE BUILDERS' JOURNAL."

The Title Pages and Index to any volume of "THE BUILDERS' JOURNAL" may be had free, upon application being made to the Office, Great New Street, enclosing 1d. stamp to cover postage of same.

Contracts Open.

BURTON-UPON-TRENT UNION.

TO BUILDERS AND CONTRACTORS.

The Guardians of the above named Union are prepared to receive TENDERS for the carrying out of certain ALTERATIONS and ADDITIONS at the UNION OFFICES situate at the Workhouse, Belvedere Road, Burton-on-Trent.

Persons desirous of tendering may see plans and specifications, and obtain Bills of Quantities with Form of Tender, at the offices of Mr. THOMAS JENKINS, Architect, Arcade Chambers, Station Street, Burton-on-Trent, by depositing the sum of One Guinea, which will be returned on receipt of a bona fide Tender.

Sealed Tenders endorsed "Tenders for Office Alterations," to be delivered to the undersigned at the Union Offices, Burton-on-Trent, not later than TEN o'clock a.m. on WEDNESDAY, the 13th DECEMBER instant.

The Guardians do not bind themselves to accept the lowest or any Tender.

By order,
 C. F. CHAMBERLIN,
 Clerk to the Guardians.
 Union Offices,
 Belvedere Road,
 Burton-on-Trent.
 1st December 1905.

BOROUGH OF FULHAM.

The Council of the above Borough is prepared, at its Meeting to be held on WEDNESDAY, the 6th day of DECEMBER, 1905, at 7 p.m., to receive TENDERS for MAKING-UP the CARRIAGE-WAY of Finlay Street, Fulham.

Plans and Specifications of the works may be seen, and any information obtained, from Mr. FRANCIS WOOD, A.M.I.C.E., F.G.S., Borough Surveyor, at his office, Town Hall, Fulham, S.W.

The Contractors are to attend personally, or be represented at the Council Meeting, to deliver their own Tenders, together with a £10 note and a Schedule of Prices, upon which the value of any extras or omissions shall be based, and to make a declaration that they pay the trade union rate of wages, observe such hours of labour as are generally accepted as fair in their trade, and that all unskilled labour shall be paid the minimum wage of 7d. per hour.

The Council does not pledge itself to accept the lowest or any Tender.

R. M. PRESCOTT,
 Town Clerk.

TOTTENHAM EDUCATION COMMITTEE.

TENDERS are hereby invited for the ERECTION of a SCHOOL to accommodate 1,200 children on the Parkhurst Road Site, Tottenham.

Applications for quantities to be made to the Architect, Mr. G. E. T. LAURENCE, A.R.I.B.A., 22, Buckingham Street, Adelphi, W.C., on or before the 9th DECEMBER next, after which date plans and specifications may be seen at his office.

The sum of two guineas will be charged for the quantities, which sum will be returned on receipt of a bona fide Tender, accompanied by the conditions and priced quantities, otherwise the deposit will be forfeited.

The priced quantities will be returned to the unsuccessful firms.

Persons Tendering will be required to deposit with the CLERK, when banding in their Tenders, in Bank of England notes or cash, the sum of ten pounds, which will be forfeited by the person whose Tender is accepted if the Contract be not executed within seven days from the date he is informed it is ready for signature.

This deposit will be repaid to the parties Tendering who are unsuccessful.

The Contractor will be required to pay all workmen on the Committee's work the recognised trade union rate of wages.

The Committee do not bind themselves to accept the lowest or any Tender.

Signed W. MALLINSON,
 Clerk to the Committee.
 Education Committee Offices,
 Philip Lane,
 South Tottenham,
 22nd November, 1905.

VOLUMES I. to XXI. of THE BUILDERS' JOURNAL.

Handsomely bound in cloth gilt, 7/- each.

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THE VALUE OF OUR EMPLOYMENT REGISTER.

THIS REGISTER was commenced as a serious endeavour on our part to meet a need that is continually felt both by EMPLOYERS and EMPLOYED, and we are pleased at the practical appreciation that has been shown by our readers since THE REGISTER was first started.

Nothing is more trying than to be out of employment, but the difficulty of the position is terribly augmented when money has constantly to be paid for advertisements in order to find other occupation.

On the other hand an Employer who has just obtained an important contract most likely needs you; and has a post to fill that you are wanting, but neither of you can find each other.

THE REGISTER serves this purpose and so meets both cases. For those wanting employment it is an inexpensive means of keeping their names and qualifications before the right people, and for the Employer it is a ready means of finding just the man he wants, without delay.

We are encouraged to find how largely our columns have been instrumental in meeting the requirements of both parties in the manner indicated above, and we thank those advertisers who have written expressing their pleasure and indebtedness to THE REGISTER.

Many have found it an invaluable aid in getting appointments, and we would urge all those who are out of work, or want to change their situations, in fact, all who have a "want," to make use of these columns and thus make THE REGISTER a record of still more value to Employers and Employed.

For 3s. we give 3 insertions (four lines), in our "Appts. Wanted" Columns, and also 6 insertions in the "EMPLOYMENT REGISTER" (see page xx).

Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C. Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Brixton.—For the enlargement of the manual training centre on the Santley Street site, for the London County Council:—

The Waring White Building Co., Ltd., London, W....	£788	0	0
F. & H. F. Higgs, Herne Hill	759	0	0
Galbraith Brothers, Camberwell Green	743	12	0
W. Downs, Walworth Road....	740	0	0
Rice & Son, 15, Stockwell Road....	730	0	0
W. Smith & Son, Kennington	647	0	0
T. G. Sharphington, Nunhead	636	0	0
W. Johnson & Co., Ltd., Wandsworth Common	618	0	0
J. Marsland & Son, Wandsworth	611	2	6
J. Garrett & Son, 17, Balham Hill	610	0	0
T. D. Leng, Deptford	603	0	0
L. Whitehead & Co., Ltd., Clapham Road	586	0	0

* Recommended for acceptance.
[Estimated cost, £785]

Coventry.—For extensions, for Messrs. Alfred Herbert, machine toolmakers. Messrs. Tait & Herbert, architects, Leicester and Coventry:—

New brassfoundry.

Garlick's Exors....	£828	0	0
Hancox & Co.	799	0	0
Isaac & Sons	770	10	0
Kelley & Son*	769	0	0

New castings shed.

E. C. & J. Keay....	613	0	0
Mattersons	625	0	0
Russell & Sons	582	0	0
Needham & Lowe ..	581	0	0
Cort and Cornick* ..	526	8	0

Power-house extension.

Garlick's Exors.	209	0	0
Hancox & Co.	285	0	0
Isaac & Sons	265	0	0
Kelley & Son*	256	7	0

Entrance lobby.

Worwood	192	0	0
Hancox & Co.	177	0	0
F. Taylor	146	0	0
Kelley & Son*	129	0	0

* Accepted.

Finchley.—For the erection of new three-department school in Squires Lane, Finchley, for the Finchley Education Committee. Mr. W. G. Wilson, F.R.I.B.A., architect, Bloomsbury Mansions, Hart Street, W.C.:—

Boys and girls school and

boundary wall.

		Infants' School.
L. F. Lamplough	£22,019	0 0 5,497 0 0
W. Butcher	19,186	17 3 6,539 13 5
W. T. Batchelor....	19,668	0 0 5,901 0 0
William Downs	19,489	0 0 5,640 0 0
John Barker & Co., Ltd.	19,239	0 0 5,831 0 0
William Tout	18,917	6 3 5,659 3 6
Martin, Wells & Co....	18,550	0 0 5,670 0 0
John Grover & Sons ..	18,483	0 0 5,496 0 0
F. & E. Davey, Ltd....	18,381	0 0 5,511 0 0
J. & C. Bowyer	18,380	0 0 5,603 0 0
W. & B. H. Davey, Ltd.	18,153	0 0 5,609 0 3
Arthur Faulks	17,900	0 0 5,220 0 0
Pollard & Brand....	17,893	0 0 5,470 0 0
Mattcock & Parsons ..	17,709	0 0 5,605 0 0
E. Laurence & Sons ..	17,624	0 0 5,547 0 0
Patman & Fotheringham	17,555	0 0 5,561 0 0
J. Jarvis & Sons	17,332	0 0 5,256 0 0
Henry Knight & Sons ..	17,239	0 0 5,360 0 0
Allen Fairhead & Son ..	17,024	0 0 5,155 0 0
Walter Lawrence & Son ..	17,034	0 0 5,275 0 0
Albert Monk	16,750	0 0 4,895 0 0
S. E. Moss & Co.	16,462	11 0 5,307 17 0
Alfred Hudson & Co. ..	16,290	0 0 4,748 7 4
Mattcock Brothers,* Wink-	16,270	0 0 4,861 0 0

field Road, Wood Green
* Accepted (for boys' and girls' school).

Kingston.—For the construction of a reservoir and other works connected with supplying the workhouse with water, for the Guardians. Mr. C. Stuart Delfosse, architect, 8, Duke Street, Kingston:—

Jenkins & Son, Leamington	£1,520	11	3
W. Watkins, Leominster	1,510	2	6
H. Dorset, Cradley Heath	1,449	7	0
R. C. Brebner, Edinburgh...	1,403	10	0

S. Wood, Hunsworth ...	£1,399	10	8
H. Davies, Bromyard ...	1,362	18	5
H. Westwood, Bromyard ...	1,303	10	0
Johnson Brothers, Hereford	1,154	11	11
C. Vaughan, Hereford...	1,172	2	0
R. Morgan, Kingston ...	1,169	10	0
B. Hamer,* Kingston ...	1,135	16	6

* Accepted.

London, S.E.—For the erection of the superstructure of new power-station at Blackfriars, for H.M. Office of Works, &c.:—

		Credit.
R. H. B. Neal, Ltd.	£43,013	—
C. Ansell	41,000	—
Foster & Dicksee....	40,832	£250
J. F. M. Patrick	39,999	983
A. Faulks	38,537	50
Perry & Co.	38,093	40
E. Lawrence & Sons ..	37,775	—
Higgs & Hill	37,444	50
W. H. Lorden & Son ..	37,273	40
Mowlem & Co.	37,088	—
Martin, Wells & Co. ...	37,023	23
W. Pattinson & Sons ..	36,811	162
Braid, Pater & Co.	36,467	70
Holliday & Greenwood	36,444	—
Cropley Brothers	36,404	100
C. Wall, Ltd.	36,198	55
H. J. Williams, Ltd.	36,187	30
Holloway Brothers (London)	36,000	—
W. King & Son	35,939	72
L. Whitehead & Co.	35,863	48
W. Johnson & Co.	35,474	205
J. Shelbourne & Co.	35,345	175
Leslie & Co.	34,987	62
W. H. Hyde	34,900	75
J. C. Johnson & Son ..	34,853	50
H. Lovatt, Ltd.	34,835	200
J. Smith & Scns	34,590	320

Slough.—For the erection of a new infirmary, for the Guardians of Eton Union:—

		Red Bricks extra.	Time, weeks.
Burfoot & Butler, Slough	£8,310	0 0	52
J. H. Margetts & Son, Reading	6,894	0 0	48
Goodwin, Reading	6,880	0 0	50
Jenkins & Sons, Southampton	6,775	0 0	26
Bloxham, Banbury	6,767	0 0	36
G. Gray, Egham	6,759	0 0	48
Batten Brothers, Reading	6,700	0 0	36
Wilcocks, Wolverhampton	6,650	0 0	40
Downley, Woking	6,649	0 0	26
Burfoot & Son, Eton Wick	6,595	0 0	45
Walden & Cox, Henley	6,587	0 0	52
H. Flint, High Wycombe	6,527	0 0	42
Rissley, Maidenhead	6,524	8 0	35
Hollis & Son, Windsor	6,520	0 0	21
Lewis Brothers, Reading	6,500	0 0	45
Jackaman & Son, Slough	6,475	0 0	32
Hammond & Son, Romford	6,455	0 0	50
Willis & Co., Aldershot	6,450	0 0	42
Harris & Co., London	6,395	0 0	20
G. Kemp, Aldershot	6,378	0 0	32
J. Appleby & Sons, Lambeth	6,368	0 0	50
Mo. E. Fitt, Reading	6,365	0 0	36
Hughes, Wokingham	6,328	0 0	45
Myall & Upson, Clacton	6,310	0 0	36
Cox & Sons, Maidenhead	6,295	0 0	32
Fear & King, Crowthorne	6,275	0 0	52
A. Foulkes, Reading	6,247	0 0	32
A. J. Colburn, Swindon	5,999	10 0	40
Stimpson, Wokingham	5,988	15 0	52
Lovell & Sons, Marlow	5,980	0 0	24
Watson, Ascot	5,955	0 0	36
Barnsley, Birmingham	5,942	0 0	32
Hawkins & Co., Ashford	5,898	7 7	24
Hunt & Son, Wycombe	5,769	0 0	26
Gibson, Wycombe	5,660	0 0	26
H. D. Bowyer,* Slough	5,616	0 0	36

* Accepted.

(Continued on page xviii.)

		Credit.
Wallis & Sons....	£34,460	£55
Galbraith Brothers	34,050	50
Waring-White Building Co.	33,989	4
J. Garrett & Son	33,675	50
F. G. Minter	33,175	—
Wisdom Brothers*	33,089	90
B. E. Nightingale	32,638	100

* Accepted.

Sale.—Accepted for the erection of the new Springfield Schools, for the Administrative Sub-Committee for Education. Mr. J. Holt, architect, 9, Albert Square, Manchester. Quantities by Mr. H. H. Brown, Manchester:—

J. E. Dean, Ashton-upon-Mersey, Cheshire....	£13,417
----------------------------------------------	---------

Stratford-on-Avon.—For the erection of a pair of villa residences. Mr. A. H. Callaway, architect and surveyor, Stratford-on-Avon:—

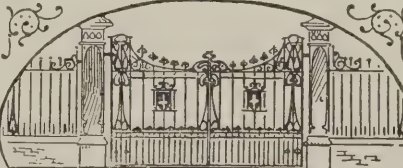
Smallwood & Co.	£1,575	0	0
Fincher & Co.	1,525	0	0
Ward & Co.	1,518	0	0
G. Euston	1,460	0	0
Wheatley & Son	1,375	0	0
E. T. Kennard	1,370	0	0
J. Cox	1,295	0	0
Price & Sons*....	1,185	15	0

* Accepted.

Twickenham.—For the erection of nineteen shops, for Mr. A. Moss. Mr. Jasper J. Kelf, architect, 15, Bishopsgate Street Without, London, E.C.:—

S. N. Soole & Son	£19,500	0	0
Wisdom Brothers	19,300	0	0
S. E. Moss & Co.	19,000	0	0
F. G. Lawrence	16,120	0	0
H. Wilson	11,788	3	0
J. J. Wheeler....	15,429	0	0

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KESWICK.**LONDON PLATE - GLASS
INSURANCE CO., LTD.**Head Office: 49, Queen Victoria Street, E.C.
Ten per cent. of the Premiums returned every six years in
cases where no claim has arisen.APPLICATIONS FOR AGENCIES INVITED.
LIBERAL TERMS FOR BUSINESS INTRODUCED.**BIRKBECK BANK**

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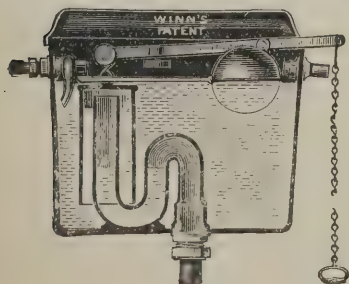
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CONTRACTORS.

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MOULDED BRICKS, &c.****GROBAK****GREEN SLATE QUARRIES.**The attention of Architects is
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Slates, which are now avail-
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(See displayed Advt. in issue for November 29, p. ii.)

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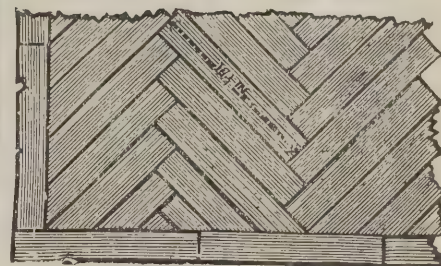
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	At Wharf.	ex Ship within one Month.	At Wharf.
17½ x 3 x 3	12 9	12 0	16 6
17½ x 3 x 2	8 3	7 9	11 5
17½ x 3 x 1½	6 9	6 3	9 3

**PRIME DRY OAK & PITCH PINE FLOORINGS**

With Special Joint to conceal Nails—

1½ x 4 Oak, 56/9 Pitch Pine 27/- per square.
1 x 4 " 45/- " 22/9 "

These prices do not include desiccation.

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Telephone Nos. 601 and 602 Avenue**FOR
BLIND
LATHS**B. BELL & CO. 67 BRIMLEY ST. BOW.
LONDON

TENDERS—cont. from p. xvi.

London, N.—For improvements at the Poole's Park School, Islington, N., for the London County Council:—
 E. Triggs, 92, The Chase, Clapham... £13,224
 G. S. Williams & Son, Richmond Street, Thornhill Square... 9,675
 McCormick & Sons, Northampton Street, Essex Road... 9,523
 J. Grover & Son, Wilton Works, New North Road... 9,373
 H. L. Holloway, Church Street, Deptford... 8,946
 L. Whitehead & Co., Ltd., Portland Place North, Clapham Road... 8,649
 E. Lawrance & Sons, 14 to 16, Wharf Road, City Road... 8,528
 L. H. & R. Roberts, * 34, Rheidol Terr., Islington... 8,296
 [The architect's estimate, comparable with these tenders, is £7,627.]
 * Recommended for acceptance.

London, S.W.—For the erection of a school on the Rosendale Road site, Wandsworth, for sixty mentally defective children, for the London County Council:—
 F. & H. F. Higgs, Herne Hill... £3,570 0 0
 W. Akers & Co., Ltd., South Norwood... 3,513 0 0
 Leslie & Co., Ltd., Kensington Square... 3,490 0 0
 J. Marsland & Sons, Walworth... 3,475 0 0
 Galbraith Brothers, 46, Camberwell Green... 3,471 15 6
 W. Downs, Walworth Road... 3,457 0 0
 E. Triggs, Clapham... 3,440 0 0
 J. Smith & Sons, Ltd., South Norwood... 3,398 0 0
 L. Whitehead & Co., Ltd., Clapham Road... 3,393 0 0
 Holliday & Greenwood, Ltd., Brixton... 3,390 0 0
 J. Garrett & Son, 17, Balham Hill... 3,354 0 0
 J. Appleby & Sons, Lambeth... 3,333 0 0
 W. Johnson & Co., Ltd., Wandsworth Common... 3,279 0 0
 G. E. Wallis & Sons, Ltd., Maidstone... 3,263 0 0
 T. G. Sharphington, Nunhead... 3,257 0 0
 J. & C. Bowyer, * Westow Street, Upper Norwood... 3,169 0 0
 [The architect's estimate, comparable with these tenders, is £3,403.]
 * Recommended for acceptance.

London, S.W.—For roadwork and platelaying in connection with the construction of tramways over the new Vauxhall Bridge, for the underground conduit system of electrical traction, for the London County Council:—
 C. Wall... £6,520 0 0
 Dick, Kerr & Co., Ltd.,... 5,543 16 7
 J. G. White & Co., Ltd.,... 5,200 12 7
 J. Mowlem & Co., Ltd., *... 4,995 0 0
 [The engineer's estimate, comparable with these tenders, is £5,391.]
 * Recommended for acceptance.

London, S.W.—For a scheme of improvements in the infants' school (which is a separate one-storey building) on the Gideon Road site, Battersea, for the London County Council:—
 J. Garrett & Son, 17, Balham Hill... £2,973 0 0
 Rice & Son, 15, Stockwell Road... 2,920 0 0
 Lathey Brothers, Battersea Park... 2,873 0 0
 E. Triggs, Clapham... 2,860 0 0
 Galbraith Brothers, Camberwell Green... 2,824 7 6
 L. Whitehead & Co., Ltd., Clapham Road... 2,817 0 0
 L. H. & R. Roberts, Islington... 2,814 0 0
 W. Johnson & Co., Ltd., Wandsworth Common... 2,807 0 0
 J. Appleby & Sons, * Cornwall Works, Lambeth... 2,664 0 0
 [The architect's estimate, comparable with these tenders, is £3,079.]
 * Recommended for acceptance.

London, S.W.—Completion of the Fulham Palace Road School, Fulham, for the London County Council:—
 W. Downs, Walworth... £3,517 0 0
 Leslie & Co., Ltd., Kensington Square... 3,498 4 5
 Lole & Co., Chelsea... 3,481 1 9
 Clarke & Bracey, 64, Coleman Street... 3,429 0 0
 E. Triggs, Clapham... 3,416 0 0
 W. Smith & Son, Kennington... 3,373 0 0
 C. Wall, Ltd., Chelsea... 3,316 9 1
 The Waring-White Building Co., Ltd., 1A, Cockspur Street... 3,300 0 0
 L. Whitehead & Co., Ltd., Clapham Road... 3,208 0 0
 Charles F. Kearley, * 195B, Kensington High Street... 3,098 0 0
 [The architect's estimate, comparable with these tenders, is £3,120.]
 * Recommended for acceptance.

London, S.W.—For the enlargement by twenty places of the manual training centre on the Brandelhow Road site, Wandsworth, for the London County Council:—
 Leslie & Co., Ltd., Kensington Square... £738 10 10
 Macey & Sons, Ltd., Strand... 647 0 0
 Lole & Co., Chelsea... 645 17 8
 E. Triggs, Clapham... 641 0 0
 J. Shelbourne & Co., 70, Fenchurch Street... 616 2 2
 W. Johnson & Co., Ltd., * Wandsworth Common... 584 0 0
 [The architect's estimate, comparable with these tenders, is £639.]
 * Recommended for acceptance.

Tralee.—Accepted for the first section of county hall, comprising offices for the County Council, Urban District Council, Harbour Board, &c. Mr. Wrenn, M.R.I.A.I., architect, 189, Great Brunswick Street, Dublin:—
 Kennedy Brothers, Tralee... £5,280

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305	Thin Mineral	30 x 40 in.	3, 6
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315	Tough blue shade, medium	21 x 43	7, 10
316	Do. stout	21 x 43	9, -
317	Thin glazed	21 x 43	6, -
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THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

December 13, 1905. Vol. 22, No. 566.

6, Great New Street, Fetter Lane, E.C.

Summary.

The Charing Cross roof collapse appears to have been due to the breaking of a tie-rod in the truss next to the wind-screen. We suggest that the factor of safety was reduced considerably by the inadequacy of theoretical reasoning in regard to the load a truss in this position has to sustain, and that this reduced the factor of safety to so small a limit that the corrosion and other contributory minor causes resulted in failure. (Page 336.)

The improvement noted in the London wood market in October was maintained in November, though it has had little effect on prices. Business for next year has not yet opened. It is certain, however, that Swedish shippers are very sanguine of establishing a substantial rise on present prices. (Page 338.)

The Liverpool timber trade has been active during the past month. A large number of foreign-made doors has been received. (Page 339.)

The penalties attaching to the use of misleading descriptions of white or red lead, indicating highest quality, whereas analysis proves them to be adulterated, are unusually heavy, even going so far as imprisonment with hard labour. In this connection the White Lead Section of the London Chamber of Commerce is prepared to examine and report on, free of charge, any sample of white or red lead bought as best, genuine, or under any other term implying highest quality. (This page.)

An interesting case to property owners was heard recently. The agent of the landlord of a house, in consideration that the tenant withdrew a threat to quit, promised that a defective kitchen floor should be repaired. This was not done, however, and as a result of the neglect the tenant's wife met with a serious accident, for which damages were claimed. Judgment was entered for the plaintiffs, but the Court of Appeal held that the female plaintiff had no cause of action. (Page 340.)

There are several firms who supply machinery of all descriptions on the hire-purchase system. This system has been in operation for a series of years, and has been highly beneficial to both hirer and owner. (Page 335.)

The Royal Academy gold medal and travelling studentship (value £200) for a design for a British embassy in a foreign capital is won this year by Mr. Leslie Wilkinson. (Page 345.)

Fraudulent Trade Descriptions.

A USEFUL work is being performed by the White Lead Corroders' Section of the London Chamber of Commerce in securing proper protection for the public in regard to the quality of white and red lead. Users, especially small buyers, have been misled in buying as "best," "genuine," or other term indicating the highest quality, a lead which on analysis has been found to be adulterated, and the Section draws attention to the fact that it is a distinct breach of the Merchandise Marks Act, 1887, to describe and sell as "best," "genuine," or other similar term, any white or red lead which contains any adulterant, such as barytes, lime or any other foreign added matter. The penalties attaching to the use of misleading terms under the Merchandise Marks Act are unusually heavy, and even go so far as imprisonment with hard labour, so that it behoves everyone in the trade to take due precautions against their offering or having in their possession for sale white or red lead which bears a misleading description within the meaning of the Act. In this connection the Lead Section of the Chamber is prepared to examine and report on, free of charge, any sample of white or red lead bought as "best," "genuine," or other term indicative of the highest quality, if a small sample of the same is sent to "The Inspector," White Lead Corroders' Trade Section, London Chamber of Commerce, Oxford Court, London, E.C. A half-pound sample will be sufficient for the purpose of analysis. It should be mentioned that the Section in its endeavours to protect the small user has undertaken several cases in different parts of the country, under the Merchandise Marks Acts, against firms selling adulterated lead as "best" or "genuine," and, with one exception, convictions have been obtained and heavy penalties inflicted. In this connection the Section particularly desires to urge buyers to take care when purchasing genuine white and red lead to insist on its being marked and invoiced as such. This is necessary for their own protection, as, in the event of the quality of the article sold by the retailer being challenged, he has only to produce his guarantee of quality, that is, the marked keg or the invoice, and the dealer at once becomes responsible and liable to prosecution should the article prove other than of the quality guaranteed. It would

be well if the protection given by the Merchandise Marks Act could be extended to building materials generally.

Lessons from Charing Cross. FROM an examination of the working drawings of the Charing Cross station roof, and the light thrown by the circumstances of the disastrous collapse last week (see p. 336 of this issue) it is apparent that there were several features in the design which may be subjected to criticism. The result of all the trusses except the wind-screen being alike, and the station being divided into equal bays, was that although the end truss next the wind-screen was theoretically considered to sustain half the preceding and half the last bay, it probably had to carry the whole of the latter, for when a high wind was blowing the gable screen with the great leverage must have given, however slightly, inwards and thrown the whole weight on to the truss. This would have reduced very considerably the factor of safety, and naturally in the course of years the corrosion would have assisted. A contributory cause may have been that the saddle expansion-bearing at the end was inefficient and probably helped to strain the tie-rod. This was improved upon in the design of the Cannon Street station, designed by the same engineer and erected two years later, in which an ordinary form of roller expansion was adopted. Another defect also acknowledged to have been improved upon in the Cannon Street roof was the instability of the trusses against overturning. This was remedied by splaying out the ends of the principals to give a wide bearing on the wall. If this had been the case in the Charing Cross roof, perhaps the wind-screen would not have toppled over. The lessons to be learnt from the collapse are the desirability of a thorough examination of all early engineering structures, because there are many roofs of this type which are equally likely to collapse, and secondly that the end truss next a wind-screen is strengthened so as to bear the extra strain due to leverage in a wind, or that the last bay is halved so that the truss shall sustain an equal amount of roof surface to the other bays and not half as much again. Whether a flaw contributed to the failure at Charing Cross or whether the rod had been reduced in section in the course of years by drawing out, due to over-strain, or to corrosion, will only appear from the Board of Trade enquiry.

THE HIRE OF BUILDERS' PLANT.

C. PASSMORE.

A GREAT difficulty is often experienced in ascertaining the terms for hire of builders' plant, as the firms who let such plant on hire do not publish any price lists, the chief reason being that advantage would be taken of them by competitors, who would quote a slightly lower price. Another reason is that the charges for hire greatly depend upon the period for which the plant is required, and whether it is wanted with or without the option of purchase; in fact, there are so many conditions affecting the charge that it is desirable to rely rather upon special arrangements than upon any fixed rates. It is obvious, therefore, that the following rates must not be taken as definite, but as approximate only. Such a complete list has never been published before, and it should be of assistance in computing approximate charges for hire. The following are

The Usual Conditions

of hiring builders' plant:—

(1) All persons (or their agents) hiring plant should see for themselves that the goods they hire are sound and sufficient for the purposes for which they are required, as ——— will not be responsible for any damage or loss incurred through unsoundness or insufficiency.

(2) When the charge for hire exceeds the amount of deposit, a fresh deposit must be paid, or the goods returned.

(3) All goods on hire must be taken, sent for and returned at the expense of the person hiring the same. All deficiency or damage to goods on hire will be charged for, together with the hire of the goods up to and including the day when such deficiency has been ascertained. When any and all goods are returned, the deposit note must be brought with them. Without this note no deposit will be returned. Goods on hire must be returned during business hours.

(4) Persons desirous of purchasing goods on hire can do so on the following terms, namely, the full value to be charged for each article and, in addition, half instead of the whole of the usual hiring fee, which will be reckoned up to the time the hirer gives notice of his intention to purchase.

(5) Scaffold cords and rope falls must not be cut, or the full value will be charged.

The above conditions vary very little with the different firms who let on hire such plant as ladders, steps, poles, &c., but for the hire of steam engines, pumping and other kinds of machinery a banker's and two trade references are generally required.

In the following list of charges for hire the writer has given the amount of deposit required, so far as can be ascertained:—

LADDERS.

	Day.	Week.	Per Month of 4 Weeks.	Per Week after 1st Month.	Deposit.
Rounds.	s. d.	s. d.	s. d.	s. d.	s. d.
15	0 6	0 9	2 3	0 6	5 0
20	0 6	1 3	3 0	0 8	6 0
25	0 7	1 6	3 9	0 10	9 0
30	0 7	1 9	4 6	1 0	12 0
35	0 8	2 0	5 3	1 2	15 0
40	0 9	2 6	6 0	1 4	18 0
45	0 10	2 9	6 9	1 6	21 0
50	0 11	3 0	7 6	1 8	24 0
55	1 0	4 0	8 3	1 10	27 0
60	1 1	5 0	9 0	2 0	30 0
70	1 2	6 0	10 0	2 2	33 0
80	1 5	7 0	11 0	2 4	36 0
85	1 7	8 0	12 0	2 8	39 0
90	2 0	9 0	13 0	2 8	40 0
95	2 3	12 0	16 0	3 6	45 0
100	2 6	14 0	18 0	4 0	50 0
105	2 9	16 0	20 0	4 6	55 0

MISCELLANEOUS.

	Day.	Week.	Per Month of 4 Weeks.	Per Week after 1st Month.	Deposit.
Scaffold boards	s. d.	s. d.	s. d.	s. d.	s. d.
Scaffold cords		1 6	3 0	0 9	15 0
per doz.		1 6	3 0	0 9	5 0
Scaffold putlogs		1 6	3 0	0 9	10 0
per doz.		2 0	4 0	1 0	22 0
Scaffold poles,		2 6	5 0	1 4	25 0
22ft., per doz.		3 0	6 0	1 6	30 0
Scaffold poles,		4 0	7 0	2 0	35 0
25ft., per doz.		0 9	2 3	0 6	4 0
Pickaxes, each		0 9	2 3	0 6	4 0
Shovels, each		0 9	2 3	0 6	4 0
Light rammers		0 9	2 3	0 6	4 0
Heavy rammers		1 6	4 6	1 0	10 0
Navy barrows	0 6	2 0	5 0	1 6	11 0
Pumps	3 0	15 0	40 0	2 0	
Drain machines	2 0	10 0	25 0	1 6	
Drain testers					
each	0 6	2 5	5 0	1 3	
Scotch crane,					
lift 15 cwt.	13 0	50 0	110 0		
Chain slings					
each	0 6	2 0	5 0		
Ladder fall					
cords	0 6	2 0	5 0		
Wheel only	0 4	1 9	3 0		
Wheel, fall and					
slings	1 6	7 6	15 0		
Painters' machines	0 6	2 3	4 6		
Cripples (wood or iron)	0 6	2 0	4 0		
Weston's pulleys, 1 ton		4 6	13 6	3 0	20 0
Weston's pulleys, 1 ton		6 0	18 0	4 0	30 0
Weston's pulleys, 1 ton		9 0	27 0	6 0	45 0
Weston's pulleys, 2 tons		13 6	40 0	9 0	60 0
Pulley blocks,					
1 sheave,		0 9	2 3	0 6	5 0
4 1/2 x 2 1/2					
Pulley blocks,		1 0	3 0	0 8	7 0
2 sheave,					
4 1/2 x 2 1/2		1 3	3 9	0 10	10 0
Pulley blocks,					
3 sheave,		1 3	3 9	0 10	10 0
4 1/2 x 2 1/2					
Pulley blocks,		1 0	3 0	0 8	7 6
1 sheave,					
6 x 1		1 3	3 9	0 10	10 6
Pulley blocks,					
2 sheave,		1 6	4 6	1 0	15 0
6 x 1		1 0	3 0	0 8	6 0
Gin blocks, gins.					
Gin blocks,		1 6	4 0	1 0	9 0
12ins.					
Gin blocks,		2 0	6 0	1 4	12 0
18ins.		1 6	4 6	1 0	10 0
Hemp falls, 1/2 in.		2 3	6 9	1 6	15 0
Hemp falls, 3/4 in.		3 0	9 0	2 0	20 0
Hemp falls, 1 in.		3 9	11 3	2 6	25 0
Hemp falls,					
1 1/2 ins.		1 6	4 6	1 0	10 0
Guide ropes,					
15ft.					
* Painters' cradles, with gear complete		15 0	50 0	10 0	60 0
Block and fall	1 6	6 0	18 0		
Window machines					
each	0 7	2 6	7 0		
Screw jacks					
each	1 6	7 6	21 0		
Floor cramps					
each	1 0	5 0			
Hoisting crabs					
each	2 6	10 0	25 0		

* Experienced men to fix rs. per hour, each assistant rod, per hour, without any responsibility on the owners of the cradles. Delivery to job and bringing away extra.

	£ s. d.
Steam winding-engine on road wheels to lift up to 1 ton	- - - per month of 4 weeks 7 0 0
7ft. portable mortar mill	- - - per month 5 0 0
7ft. combined mortar mill and engine	- - - per month of 4 weeks 9 0 0
1/2 yd. tipping skips	- - - per week 0 18 0
Hand crab	- - - per week 0 11 0
12-h.p. portable engine	- - - per month 8 0 0
Circular saw bench and saw	- - - ditto 3 0 0
No. 4 pulsometer pump with foot valve, suction, strainer and two lengths of delivery pipe	- - - per month 5 0 0
4-h.p. portable engine, including fuel and attendance	- - - per day 2 0 0
6-h.p. portable engine, including fuel and attendance	- - - ditto 2 10 0
8-h.p. portable engine, including fuel and attendance	- - - ditto 3 0 0
10-h.p. portable engine, including fuel and attendance	- - - ditto 3 10 0

Friction barrow hoist	- - - per month	£ s. d.
Traction engine, including fuel, attendance	- - - per day	4 0 0
Traction engine driver	- - - per week	1 15 0
Road scarifier machine and labour inclusive, per day (this machine will scarify any roadway at a cost of 1/2d. per yd. super.)	- - -	5 0 0
Traversing crane	- - - per day	1 0 0
Hydraulic presser	- - - ditto	1 5 0
Steam crane	- - - ditto	1 12 6
Saw frames	- - - ditto	1 17 6
Mortar mill	- - - ditto	0 15 0
Saw benches	- - - ditto	1 5 0
Screw presser	- - - ditto	1 0 0
Hire of casks (each)	- - - ditto	0 0 6
half casks (each)	- - - ditto	0 0 3
sacks (each)	- - - ditto	0 0 2
hand trucks	- - - per hour	0 0 3
horse alone	- - - per day	0 9 0
cart and man	- - - per hour	0 1 0
2 horses, cart and man	- - - per day	0 12 0
stone truck and 2 horses	- - - ditto	1 2 6
timber carriage and 2 horses	- - - ditto	1 5 0
van and 2 horses	- - - ditto	1 5 0
6-h.p. portable engine and 6ft. mortar mill	- - - per month	8 0 0
8-h.p. portable engine and 6ft. mortar mill	- - - ditto	10 0 0
10-h.p. portable engine and 6ft. mortar mill	- - - ditto	12 0 0
Tarpaulins, 18ft. by 12ft.	- 1 3 per week	30 0 deposit.
24ft. by 18ft.	- 2 6 "	60 0 "
White canvas sheet, 18ft. by 12ft.	- 1 3 "	30 0 "
White canvas sheet, 24ft. by 18ft.	- 2 6 "	60 0 "
Soft white canvas sheets (painters' drop sheets)	per sq. yd.	0 1 " 20 0 "

HEATHMAN'S PATENT TELESCOPIC LADDER TOWERS.

	Minimum. 2 days or less.	After, per day.
For reaching up to—	s. d.	s. d.
24ft.	10 6	3 0
30ft.	12 6	3 6
40ft.	15 0	4 0
45ft.	20 0	4 6
50ft.	25 0	5 0

Extra for joists and flooring to lay from one tower to another so as to form long scaffolding.

BUILDERS' AND PAINTERS' TRESTLES.

Each Trestle.	Day.	Week.	Per Month of 4 Weeks.	Per Week after 1st Month.	Deposit.
Feet high.	s. d.	s. d.	s. d.	s. d.	s. d.
6	0 6	1 3	3 9	0 10	12 6
8	0 6	1 6	4 6	1 0	15 0
9	0 7	1 9	5 3	1 2	17 6
10	0 8	2 0	6 0	1 4	20 0
11	0 9	2 3	6 6	1 6	22 0
12	0 10	2 6	6 9	1 8	24 0
13	0 11	2 9	7 0	1 10	26 0
14	1 0	3 0	7 3	2 0	28 0
15	1 1	4 6	7 6	2 3	30 0
17	1 2	6 0	8 0	2 6	33 0
20	1 4	7 0	8 6	3 0	36 0

PAINTERS' STEPS.

Giving Steps.	Day.	Week.	Per Month of 4 Weeks.	Per Week after 1st Month.	Deposit.
Feet.	s. d.	s. d.	s. d.	s. d.	s. d.
6	0 4	1 0	3 0	0 3	8 0
8	0 5	1 3	3 6	0 10	10 0
10	0 6	1 6	4 0	1 0	12 0
12	0 8	1 9	4 6	1 2	15 0
14	0 10	2 0	5 3	1 4	17 6
16	1 0	3 0	6 0	1 6	19 0

Travelling Cradles.

The charge for the hire of Palmer's wire-supported travelling cradle is 20s. per week per cradle, and fixing extra according to roof. There is such variety of detail in roofs that without a knowledge of the roof or a rough sketch it is difficult to estimate what the fixing will cost. In London it is generally safe to estimate a 25ft. frontage at £2, but it quite depends on the nature of the roof. Estimates for fixing can be had free of charge from the firm, who generally quote inclusive terms, including fixing, hire, and removal on completion.

In the hiring of plant it is usual for the hirer to pay carriage and all expenses of removal, &c. The charges for hire have also to be paid monthly (for large plant) and in advance.

Steam-rollers.

There are several firms in different parts of the country who let out steam-rollers on hire. The rate is usually from about 3s. per hour, or from 25s. to 30s. per day of 10 hours, including man's time, fuel and everything except water. Where the rate is quoted exclusive of the above it may be taken that an engine-driver's wages will be from 35s. to 45s. per week, and the consumption of fuel about $\frac{1}{2}$ cwt. per hour—say a cost of 7d. per hour. About 200 sq. yds. of metalled roadway can be rolled down in an hour.

The Hire of a Steam Navvy

is an exceptional thing, as it is only used by large contractors, who buy the machines from the makers. Applicants have been told to apply to Messrs. Wilson & Co., of Liverpool, Messrs. Whitaker Brothers, of Leeds, and Messrs. Ruston & Proctor, of Lincoln, in regard to the hire of steam navvies. These firms, however, do not let steam navvies on hire, but make them to order. The best people to apply to would be large contractors like Messrs. Pearson & Son, Aird & Sons or Pethick Brothers. The cost of hiring a steam navvy may be anything from £3 to £15 a day or from £100 to £400 a month. The working expenses may also vary from 25s. to 40s. per day for coal, water, oil, wages, &c.

The Hire-Purchase System.

There are several firms who supply machinery of all descriptions on the hire-purchase system. This system has been in operation for a series of years, and has been highly beneficial to both hirer and owner, as the hirer gets the opportunity of availing himself of machinery that is self-supporting, whilst the owner has full security for his property without the publicity of registering it as a bill of sale; moreover, the hirer becomes the absolute owner of the machinery, provided, of course, that due payment has been made of all the instalments agreed upon. The terms of payment vary according to special circumstances, but the following may be taken as a guide:—One-third of the ascertained total purchase price in cash, and the balance with interest at 5 per cent. spread over a term of two years.

The machinery required is selected in the ordinary manner, and is supplied to the hirer under a simple agreement (a document requiring no registration and to which no publicity whatever attaches). The extra charge may be estimated at 5 per cent. on the amount for which payment is deferred, which amount is generally allowed should the hirer desire to fully pay off the instalments before they become due under the terms of the agreement.

Supposing that a builder requires machines the list price for which is, say, £400, and that he cannot conveniently spare more than £80, and requires the balance of £320 to extend over a period of twelve months, the terms would be as follows:—

COST OF MACHINES.

Machines	£	s.	d.
5 per cent. on £320 for 12 months	400	0	0
	16	0	0
	£416	0	0

PAYMENTS UNDER HIRE-PURCHASE AGREEMENT.

Cash on signing agreement	£	s.	d.
1st quarterly payment	80	0	0
2nd "	84	0	0
3rd "	84	0	0
4th "	84	0	0
	£416	0	0

So that for an extra charge of £16 on the list price of machines the hirer becomes absolutely possessed of the machines in twelve months, by which time it is presumed that the machinery will have earned its cost. Arrangements and the amounts to be paid down vary according to circumstances and the different firms who supply machinery on the above terms.

Stone-breaking Machines

can be had on hire, with option of purchase or deferred payments, as follows:—

Size of stone each machine will take.	Product per hour to zins. size and under, about	Product per hour to 1 in. size and under, about	Price.	Terms on hire, with option of purchase, per month.
ins. ins.	tons cwt.	tons cwt.	£	£
10×5	3 0	1 14	45	4
10×6	3 5	2 1	50	
12×7	4 0	2 10	65	
13×7	4 15	3 0	70	5
14×7	5 10	3 10	75	
15×7	6 0	4 0	85	
15×8	6 10	4 10	95	6
15×9	7 0	5 0	110	
16×9	7 15	5 10	120	
17×9	8 10	6 0	130	8
18×9	9 0	6 10	135	
20×9	10 0		140	
20×10	All large machines of any type are more for breaking large stones than for getting large quantities through them.		145	10
20×11			150	
20×12			160	
24×12			200	
24×13			220	

Form of Agreement.

In the case of hiring plant on the hire-purchase system it is usual for the owner of the goods to fix a small plate to the machine to prevent it being seized should the builder become bankrupt or make any arrangement with his creditors during the period in which the instalments are being paid and for the purpose of purchasing the machine. The following is an agreement which has actually been used in practice. It may therefore be taken as a basis for similar agreements, or without alteration if applicable:—

An agreement made the _____ day of _____ one thousand nine hundred and _____ between _____ of _____ in the county of _____ (hereinafter called the lessor) of the one part and _____ in the county of _____ (hereinafter called the tenant) of the other part whereby it is agreed as follows:—

(1) The lessor will let and the tenant will hire the machinery, articles and effects enumerated in the schedule hereto (hereinafter called "the scheduled articles") on the conditions set forth in the following clauses and in the annexed schedule.

(2) The tenant shall during the hiring pay to the lessor the several rents set forth in the schedule hereto on the days herein respectively mentioned.

(3) If default is made in the payment of any of the said rents the tenant shall pay the lessor interest on the rents in respect of which default is made at the rate of 5 per cent. per annum from the several days when such rents become due until payment.

(4) The tenant shall take proper care of the scheduled articles and keep the same in good substantial repair, working order and condition.

(5) The plates attached to the scheduled articles inscribed with the lessor's name and address shall remain attached thereto for the purpose of making the ownership publicly known, and such plates shall not be removed or defaced by the tenant. If any such plates shall be injured or defaced the tenant shall within three days restore the same to their proper condition.

(6) If the scheduled articles or any of them are removed, seized or taken out of the possession of the tenant, the said tenant shall within twenty-four hours give written notice to the lessor of such removal, seizing or taking, and also give to the lessor the address of the place to which the same are removed.

(7) The tenant shall during the hiring keep the scheduled articles insured against fire, in the several sums set opposite thereto respectively in the schedule. Such insurance shall be effected in the name of the lessor in some office approved in writing by the lessor. The policy of insurance and the receipts for

the premiums paid thereunder shall be delivered to the lessor. If the tenant make default in effecting or keeping up such insurance, the lessor may effect and keep on foot the same, and the tenant shall repay to the lessor all moneys paid by the lessor for such insurance with interest thereon at the rate of 5 per cent. per annum until payment. Any moneys received under any policy effected under this agreement shall be applied in replacing or restoring the articles in respect of which the same were paid, but subject to the right of the lessor in the first place to retain thereout any sums which may be due from the tenant to the lessor under this agreement.

(8) The lessor shall at all time by his officers and agents have access to the scheduled articles to inspect the condition thereof.

(9) The tenant shall within ten days after notice in writing from the lessor of any want of repair or injury in or to the scheduled articles, or any of them, make good any such want of repair or injury to the satisfaction of the lessor.

(10) The tenant shall upon demand by the lessor or any person authorized by the lessor produce the last receipt of the rent of the premises where the scheduled articles or any of them may be.

(11) The tenant shall not assign this agreement or sublet or part with the possession of the scheduled articles or any without the consent in writing of the lessor.

(12) The tenant may determine this agreement and the hiring thereunder at any time by delivering to the lessor or to his order at his own cost and expense the scheduled articles so let to him on hire by the lessor as aforesaid.

(13) Upon the happening of any of the following events, that is to say:—

(a) If a receiving order is made against the tenant or the benefit of any act is taken for the relief of insolvent debtors;

(b) If the tenant make any assignment for the benefit of or compound with his creditors;

(c) If any distress or any execution is levied or sued out against the tenant;

(d) If any rents payable under this agreement are in arrear for fourteen days after they respectively become due, whether demanded or not;

(e) If the tenant commit any breach of any of the provisions herein contained,

the hiring shall determine and the lessor may without further notice or demand enter upon the premises where the scheduled articles may be and take possession of and remove the same.

(14) Notwithstanding the determination of the hiring under either of the two preceding clauses and the resumption of the possession of the scheduled articles by the lessor, the tenant shall remain liable to the lessor for all rents and other sums of money and interest which have become due to the lessor, including the apportioned rent down to the date of the retaking or delivering possession, as the case may be, and shall also remain liable for all breaches by the tenant of the provisions of this agreement prior to such retaking or delivery of possession. The tenant shall also pay to the lessor all the expenses the lessor may incur in or about such entry, retaking of possession or delivery and removal.

(15) Upon payment by the tenant of the last of the rents hereby reserved and all other sums (if any) which may be due to the lessor from the tenant under this agreement, the scheduled articles shall become the property of the tenant, but subject to this provision the scheduled articles shall be and remain the sole property of the lessor.

(16) All the powers and provisions herein contained shall be exercisable by and extend to the lessor or his assigns, and the expression

"the tenant" shall include his executors, administrators and assigns.
As witness the hands of the said parties the day and year first above written.
(Signatures over 6d. stamp.)

Witnesses

THE SCHEDULE REFERRED TO IN THE AFORE-
SAID AGREEMENT.

Sums in which
the hired machinery
is to be insured
against fire.
£ s. d.

(1) A list of the hire
machinery.

Dates of Payment.

1904.		£	s.	d.
January	- -	1	month's hire	
February	- -	"	"	"
	- -		and so on.	

CHARING CROSS ROOF COLLAPSE.

OF the terrible disaster caused by the collapse of two bays of the roof at Charing Cross Station on the evening of December 5th, the daily press has already reported in full, so far as the ordinary details are concerned, but in connection with the accompanying illustrations we desire to make a few remarks on the technical aspect of the subject. The lessons to be learnt from the catastrophe will be found dealt with as a leader in this issue.

Briefly, it may be stated that the result of the collapse was as follows:—The station roof was demolished for a distance of 70ft. from north to south, the entire span, 164ft. in width, collapsing, and a large portion of the auditorium of the Avenue Theatre wrecked on the west side of the station. It seems apparent from the accounts of the

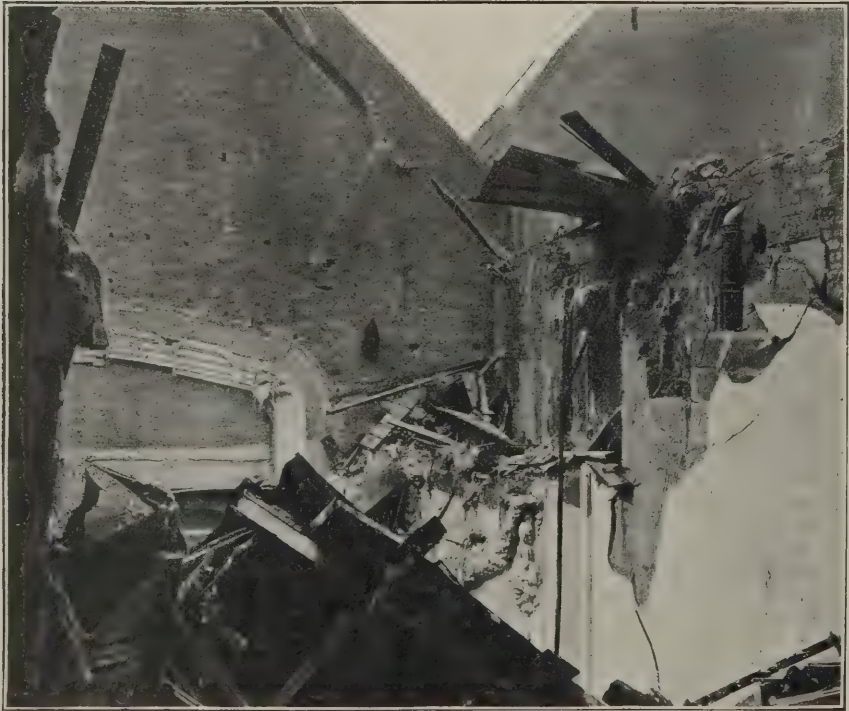
disaster, and from an examination of the wreckage which we have made, that what really happened was that the tie-rod of the first bowstring roof truss behind the wind-screen snapped. The portion of the roof sustained by this truss then curved inwards, pulling over the wind-screen, which in falling broke right across the middle, tipping over lumps of masonry on the east side into the cab rank in Villiers Street, and on the west side forcing nearly the whole height of the wall down, throwing this brickwork and a certain amount of ironwork on to the roof of the Avenue Theatre, at the end of Northumberland Avenue, which was in course of reconstruction at the time. Our views clearly show this. In the large view it will be seen how the wind-screen lays across the station, spread out like a fan, and the marks where it scored the eastern wall in falling will also be noticed. The portion of the wall demolished by the western end of the wind-screen is shown in another view, with the end of the bottom boom or girder resting on the portion of the wall still left standing.

The small court separating the Avenue Theatre from the station wall has a large amount of debris at the bottom. The wall that fell over on to the Avenue Theatre smashed in the roof over the auditorium, as the accompanying photograph shows. The debris laying against the outer wall of the Avenue Theatre rendered this unsafe and it had to be shored up.

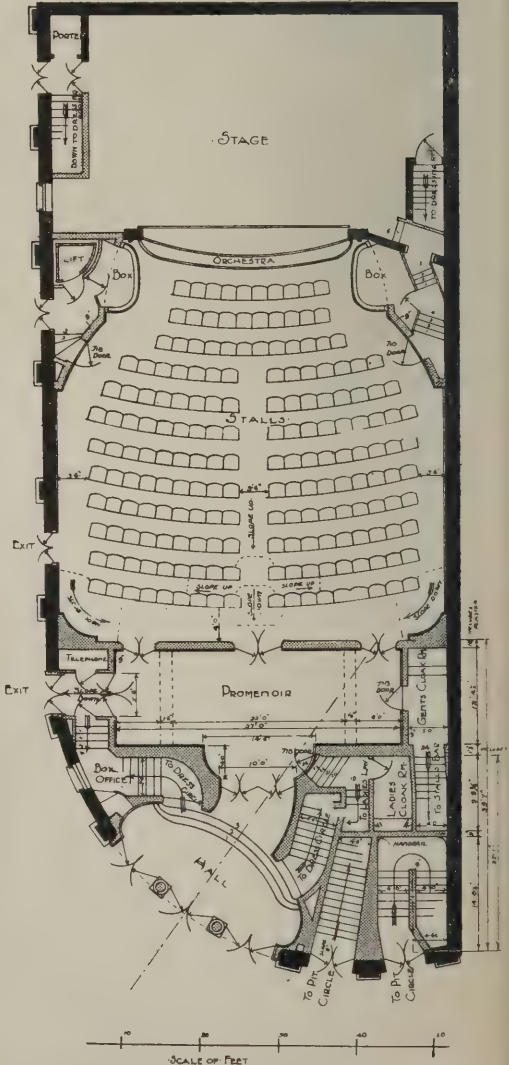
There is some confusion in the accounts of the disaster, but we think that the fact that the tie-rod of the roof truss behind the wind-screen was the cause is fairly well established.



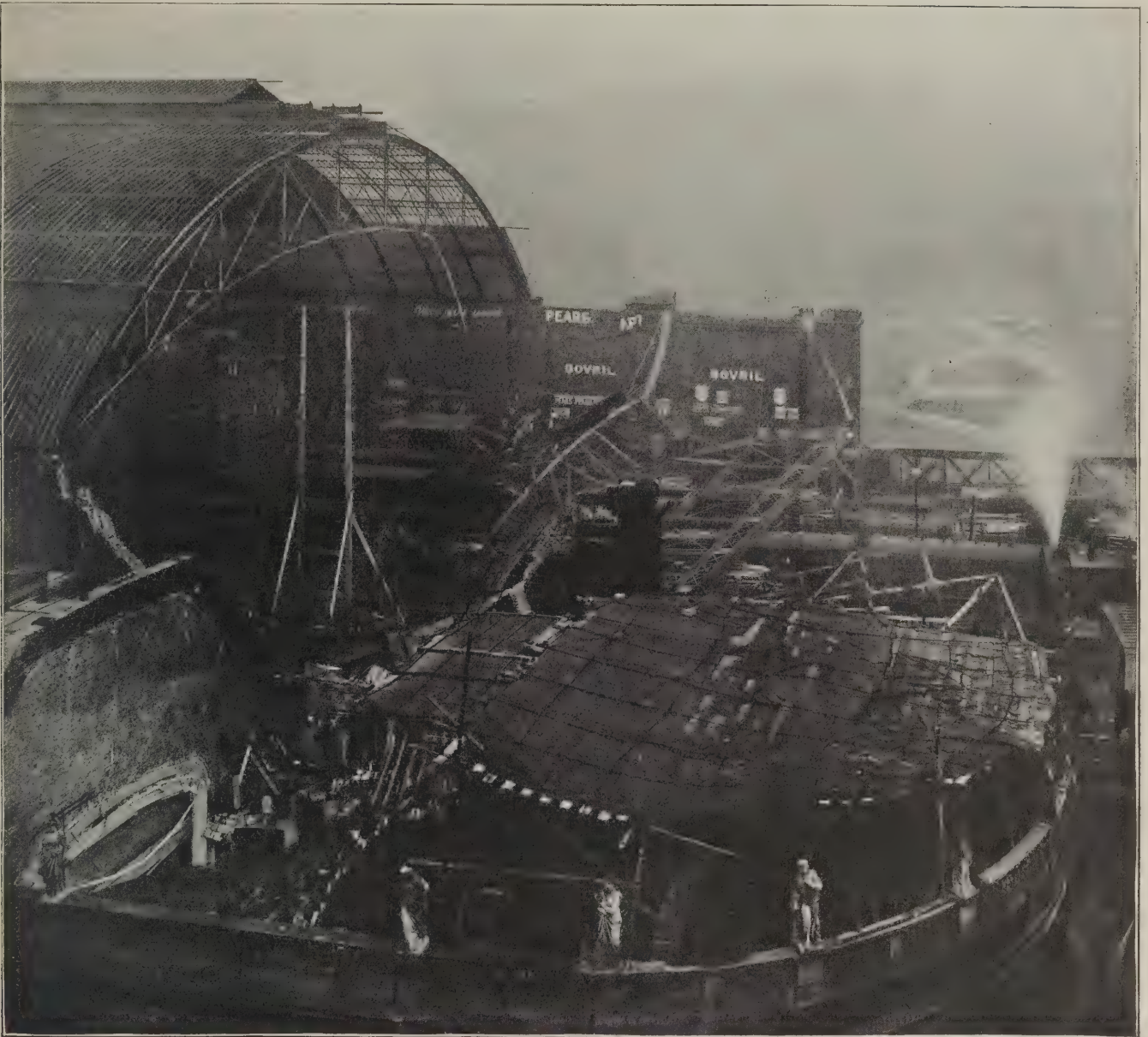
VIEW SHOWING END OF WIND-SCREEN RESTING ON WESTERN WALL.



VIEW INSIDE AVENUE THEATRE SHOWING WRECKAGE OF AUDITORIUM ROOF.



THE AVENUE THEATRE AS RE-PLANNED:
GROUND-FLOOR AREA. DETMAR BLOW AND
FERNAND BILLEREY, ARCHITECTS.



CHARING CROSS STATION ROOF COLLAPSE: VIEW OF THE DISASTER.

Sir Benjamin Baker, who was called in to assist Mr. P. C. Tempest, the Chief Engineer of the South-Eastern and Chatham Railway, ascribes the disaster to this, as also does the official statement issued by the general manager of the company. The "Daily News" published a more circumstantial account from an eye-witness inside, who said that he first heard a loud noise in the roof which caused him to look towards the bridge end of the platform, where he saw the tie-rod had snapped off about a third of the way across. An outside eye-witness from the Savage Club, whose attention was attracted by a rumbling noise, described how he saw the wind-screen bend inwards towards the station and seem to break as it dropped. Another witness said he was inside towards the river end of the station and saw the crown of the arched roof bend and begin to give first, while another witness from outside the station is said to have observed a kink in the top of the roof. We think this clearly proves that the truss was the faulty member and not the wind-screen.

We publish a section of the roof to show the type upon which it was designed by the late Sir John Hawkshaw and constructed and erected by Messrs. Cochrane & Co., of Dudley. The station was opened in 1864. The roof is 512ft. in length and divided into equal spaces by fourteen wrought-

iron trusses in addition to the gable wind-screen. The clear span is 164ft. The principals, it will be seen, have vertical uprights and are trussed and divided into nine equal spaces. These trusses are placed 35ft. apart. The rise of the tie-rod is 25ft. and of the curved rib 45ft. above the springing level, giving a truss 20ft. deep at the centre. The trusses are fixed at one end and hinged to a saddle bearing at the other. There are no wind ties, but intermediate lattice frames give stiffness. The roof covering consists of glass and zinc.

The working drawings of this roof are to be found in the 1864 volume of "A Record of the Progress of Modern Engineering," edited by William Humber, and published by Messrs. Crosby, Lockwood & Son.

The Avenue Theatre, which has so greatly suffered by the Charing Cross catastrophe, was in course of partial replanning and re-decoration under the direction of Messrs. Detmar Blow & Fernand Billerey, architects. The accompanying plan shows what difficulties had to be faced to satisfy the London County Council requirements and to give a spacious and architectural treatment of the auditorium. Nearly the whole of the wall-surface and auditorium was to be covered with paintings. The work was going to be completed by the end of this month, but it has been terribly smashed, as the photographs show. None of the walls or tiers of the theatre have fallen down, but it appears that they could hardly be safely restored, so much are they cracked.

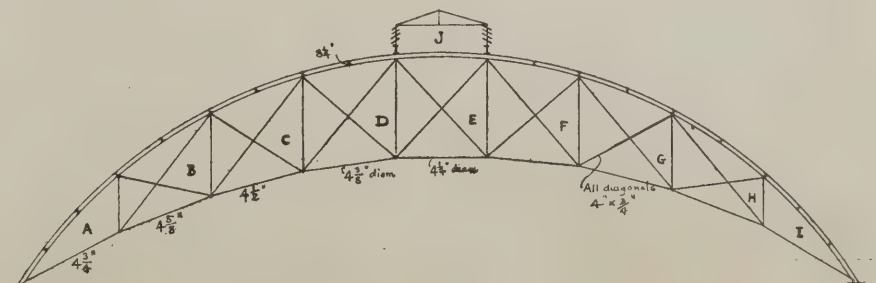


DIAGRAM OF THE ROOF TRUSS.

THE TIMBER TRADE.

London Market in November,

THE improvement noted in the London wood market in October was maintained in November, although it has still had but little effect on prices. The importation was about normal, rather more than usual from Swedish and Norwegian ports and rather less than usual from Russia. The deliveries from the docks totalled to within 400 standards of those for November last year, while the overside figures exceeded those for November, 1904, by 2,400 standards. In this last item, Messrs. Churchill & Sim observe, there is a cheerful significance that the shrinking of market power is perhaps at an end, and that a better state of things may at last be hoped for. Business for next year has not yet opened except for such specialities as are no guide to the general market. It is certain, however, that Swedish shippers are very sanguine of establishing a substantial rise on present prices during the coming selling season. Their hopes are based largely on the paralysing effect of political and financial events in Russia on the competing supplies from that country, which effect it is easy, however, to over-estimate; but they are on more substantial ground when they point to the small stocks held in this country and to the improvement in general trade here, which should have had time to affect the wood trade, though late as usual, in the coming year. The hindrance of the expected General Election during the winter months should be only of transitory importance.

The abstract of dock stock, consumption, &c., for November, published by Messrs. Foy, Morgan & Co., is given in the table at the foot of this page.

Dock Stock.

The stock of wood in the public docks on November 30th was:—

	Pieces.
Foreign deals and ends - - -	1,759,000
Do. battens - - -	2,600,000
Pine deals and battens - - -	979,000
Spruce do. do. - - -	898,000
Boards, rough - - -	4,361,000
Do. prepared - - -	6,826,000
Totalling 17,623,000 pieces, as against 19,838,000 for 1904, 23,391,000 for 1903, and 23,458,000 for 1902.	

In other kinds the stock was as follows:—

Foreign wainscot logs - - -	174 pieces.
Do. oak timber - - -	725 loads.
Do. fir timber - - -	2,433 do.
Do. Oregon pine, &c., spars and masts - - -	5,649 do.
Colonial oak timber - - -	5,514 do.
Do. birch timber and planks - - -	4,946 do.
Do. elm and ash timber - - -	1,052 do.
Do. yellow pine - - -	533 do.
Do. red pine - - -	64 do.
United States pitch-pine timber - - -	15,983 do.
Do. do. deals - - -	39,000 pieces.
East India teak - - -	6,605 loads.

The deliveries for the first eleven months have been—

	Pieces.
Foreign deals and ends - - -	2,903,000
Do. battens - - -	5,236,000
Pine deals and battens - - -	979,000
Spruce do. do. - - -	1,268,000
Boards, rough - - -	4,947,000
Do. prepared - - -	13,693,000
Totalling 29,026,000 pieces, as against 31,287,000 for 1904, 33,524,000 for 1903, and 35,856,000 for 1902.	

The deliveries for November

were as follows:—

	Pieces.
Foreign deals and ends - - -	298,000
Do. battens - - -	427,000
Pine deals and battens - - -	93,000
Spruce do. do. - - -	97,000
Boards, rough - - -	491,000
Do. prepared - - -	1,147,000
Totalling 2,553,000 pieces, as against 2,695,000 for 1904, 2,870,000 for 1903, and 3,298,000 for 1902.	

Deliveries from Ship to Craft.

The deliveries direct from ship to craft for the first eleven months of the year have been:—

	1904.	1903.	1902.
	P.s.h.	P.s.h.	P.s.h.
Deals & battens - - -	110,650	102,849	107,121
Boards - - -	24,884	18,911	22,921
Total -	135,534	121,760	133,051
	P.s.h.	P.s.h.	P.s.h.
Deals and battens - - -	7,133	5,623	8,069
Boards - - -	2,680	1,826	2,204
Total -	9,813	7,449	10,273

Soft Woods.

Swedish Deals and Battens.—There is little change to note in prices for Swedish goods in London during November. The importation has been a large one all round—deals, battens and boards—but the tone of the market has been good throughout, and, especially for deals, there has been some indication of a steadier demand.

Norwegian Boards.—The importation during November of Norwegian prepared boards was just under that of November last year, and with no further falling off in the demand a more defined improvement in prices might have been looked for. The large arrivals from Sweden have, however, prevented this, and rates are still very little over those of a month ago.

Russian Deals.—There has been nothing in the political situation in Russia to put a stop to the export of wood, and this has gone on smoothly without any exceptional hindrance. The importation to London, however, during November was small, shippers having sold out their later supplies to more attractive markets.

Finnish Battens.—There was a considerable arrival of Finnish battens in London during the month, which kept the market steady, and the growing competition to secure stock at the old prices has not yet proved strong enough to raise them much beyond the level of October.

Prussian Timber.—There is very little life in the market here for fir timber. The importation has been a small one, and prices at the shipping ports are high, while the rise in quotations for pitch-pine timber should also have helped the Danzig shipments. Nevertheless London prices remain unaffected, and any endeavour to sell results unfavourably. For oak timber there has been a better demand again, but only at low prices, which show little improvement on those of the summer.

Canadian Timber.—In November the arrivals of pine and spruce deals from the St. Lawrence were very small, and the spruce shipments from New Brunswick, though larger than those in November last year, were also quite unimportant. The London

market for pine deals has been very dull, and quotations are only maintained by holding on to the small stocks. For spruce, prices are nominally higher again in sympathy with the scarcity, the high cost and the genuine rise in other classes of whitewood, but they are paid very grudgingly, and for wholesale quantities the market can hardly be said to have been stronger than it was in October. A good deal of sawn timber was ponded in London during November, and the stock is fairly up to current requirements, although still quite short enough if the deliveries are to increase as they have done during the past month. Quotations for wood for shipment have risen to an altogether exceptional level, and there are the usual statements in such circumstances that prices are never coming down again. No doubt this wood has been sold too cheaply in the past and may likely enough not come down again to its former level, but there will continue to be fluctuations in this as in other things, and a cargo of 12in. Oregon pine timber of fine length which arrived in London during November points to a possible alternative source of supply.

Hardwoods.

Teak.—Messrs. Denny, Mott & Dickson Ltd., state that the landings in the docks in London during November consisted of 33 loads of logs and 74 loads of planks and scantlings, or a total of 405 loads, as against 1,133 loads for the corresponding month of last year. The deliveries into consumption were 804 loads of logs and 551 loads of planks and scantlings—together 1,355 loads, as against 1,094 loads for November, 1904. The imports continue to be very inadequate, having during November only amounted to some 30 per cent. of the consumption. The demand continues to be checked by the still-advancing cost, but stocks in the hands of consumers have run so low that the necessity of providing for work in hand is driving unwilling buyers into the market, and probably the demand will continue to develop, whilst the supplies give no such promise—so far as Rangoon, Moulmein and Bangkok descriptions are concerned. These conditions are giving a great impetus to shipments from Java, but the supply of this wood in merchantable sizes cannot be sufficient to compensate for the serious falling off in the shipments from Burmah and Bangkok.

Messrs. C. Leary & Co. observe that for sellers the outlook continues favourable, in so far that the demand is maintained and no difficulty is experienced in placing the available supplies.

Mahogany.

This market developed little new feature during November. The imports were very moderate, and the demand quiet—though sufficient, seeing the moderate stocks on hand. African wood hardened in value, but all other descriptions can only be said to be firm at recent values.

Odessa Oak.

Next year's supplies of this wood may be disturbed by the disorder in Russia; but subject to this, the season's shipments from Odessa promise to be of the same high standard as received this year.

ABSTRACT OF STOCK, CONSUMPTION, &c., FOR NOVEMBER.

S.C. Dks. and M. Dks.	Deals (Fir).	Battens (Fir).	Pine.	Spruce.	Pitch-pine Deals.	Deals and Battens in Aggregate.	Rough Boards (All Countries).	Flooring.	Floated Timber.
	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Pieces.	Loads.
Public dock stock - - -	1,508,143	3,011,728	978,100	898,598	39,246	6,435,815	4,366,760	6,825,729	24,500
Monthly public dock consumption - - -	259,267	496,850	96,129	106,744	8,614	967,604	523,086	1,253,395	—
Overside stock - - -	972,251	1,863,187	360,484	400,250	—	3,596,212	1,961,572	1,494,790	3,177
Overside consumption (estimated of dock):—									
82 per cent. Sawn									
55 " " Planed	212,599	407,417	78,826	87,530	—	786,372	428,531	66,967	—
Duration of supply at same rate of consumption - - -	5'26 months.	5'39 months.	7'65 months.	6'69 months.	4'56 months.	5'72 months.	6'64 months.	4'45 months.	7'71 months.

LIVERPOOL TIMBER TRADE.

(By our Own Correspondent.)

THE Liverpool timber trade has been active during the past month. Some kinds of wood have been neglected and deliveries have been very light, but taking hard and soft woods together good business has been done and there has been a big movement of tonnage. In spite of the much-talked-of stopping of the North American trade in builders' woods, consequent on the icing-up of the rivers, there has been no scarcity in the arrivals of such woods up to the present time, nor is there likely to be. Stocks of Canadian pine deals have been accumulating, the position of deals generally appearing to indicate a change in the field of consumption, due no doubt, so far as city buildings are concerned, to the increasing employment of steel and concrete. The new cotton exchange now being erected in Old Hall Street, Liverpool, by the Waring White Building Co., Ltd., of London, from plans by Messrs. Matear & Simon, architects, of Liverpool, is a striking illustration of this. Another instance is afforded by the new head offices of the Mersey Docks and Harbour Board, at the George's Dock, also in course of erection.

Deals.

Recent arrivals of spruce and pine deals from New Brunswick and Nova Scotia have been on a fair scale, and these woods have been in steady demand. The later arrivals have included consignments for David Roberts, Son & Co., Watson & Todd, Robert Cox & Co., Jonathan Gray and John J. Swan. An ample stock of Canadian deals is held at Liverpool, though the stock is not so large as at the corresponding date last year.

Baltic deals have come to hand in quantities which have well sufficed to maintain stocks, and values are practically without change. The total stock is slightly in excess of the stock held at the corresponding time a year ago.

Flooring Boards.

Arrivals of Norwegian boards have been on a limited scale. The demand for flooring boards has been fairly brisk, so that stocks have been reduced and values have improved.

Pitch-pine

has been in limited supply, and with a good demand stocks have been worked down, so that prices rule higher. The stock of log stuff is now much below the stock at the same date last year and still less than in 1903.

Imported Doors.

Some large consignments of framed doors have arrived and others are due. Goods of this class are now coming regularly to hand, and represent an important branch of the trade in builders' wood. Among the recent arrivals have been consignments of upwards of 2,000 and 1,000 (with larger numbers still to arrive) for Messrs. Collier & Procter; and a consignment for Mr. John J. Swan. Among other timber Messrs. Joseph Owen & Sons received a consignment of 3,000 bundles of plasterers' laths.

Oak.

The arrivals of oak have not been extensive. First-quality planks for wagon work have been in good demand, and full prices have been obtained. This class of oak has moved the most freely. Late consignments of oak have been received by Messrs. John Kendall & Co., Lytle & Pollock, R. H. Williams & Co., Joseph Owen & Sons, Ltd., and James Kennedy & Co., Ltd., most of the consignments being of plank or quartered timber.

Mahogany.

Stocks of mahogany were offered for sale by auction in Liverpool on November 16th and 17th. A large quantity of timber of current sorts was catalogued for the two days, and on the whole sold freely and well, nearly



SKETCHES IN CATALONIA, BY H. G. IBBERSON, F.R.I.B.A.
(Royal Academy Exhibition, 1905.)

1,250,000ft. of mahogany, chiefly African, changing hands. The African timber ranged in price from 2d. to 3s. 4d. per ft. super., this last-named price having been paid for some very fine Sekondi wood.

Walnut

in logs, planks and boards has also arrived in ample quantities. At the sale by auction on November 16th thirty-seven logs of walnut brought from 1½d. to 2¼d., the average being 1½d. Consignments of walnut have lately been received by Messrs. John Kendall & Co. and Messrs. Vincent, Murphy & Co.

The Liverpool Timber Trade Association is again giving attention to the old and perennial theme of the trade's relation to the Mersey Docks and Harbour Board. The Association met on November 14th, under the presidency of Mr. J. Harrison Jones (of David Roberts, Son & Co., Ltd.) and again discussed this old trade question, and considered the prospects of securing larger representation on the Dock Board in view of the probable effect of the great scheme of dock-extension at the north end of the city, with which the Board will shortly be occupied. A special committee was appointed to watch over the interests of the trade and to report to the Association as occasions may require. The Board's scheme may affect the Liverpool timber trade very favourably or unfavourably.

Hence the desirability of the trade keeping a sharp look-out over the scheme at its inception. In the election which will take place on December 20th the Association decided to support the candidature of one of its vice-presidents, Mr. J. Holford Harrison, of the firm of Harrison, Robinson & Co., of Liverpool, as representative of the timber trade, for a seat on the Mersey Docks and Harbour Board.

Saw-mill Extension.

The past month witnessed the opening of a new and modern saw-mill at Bootle. This mill, which will be known as the Titan Mill, has been erected and equipped for Messrs. Smith Brothers, who have had a mill at Bootle for some years. The new mill stands on the east side of Rimrose Road (which forms a continuation northwards of Derby Road, now the chief timber-trade artery of the district) and was designed by Mr. F. Smith, a member of the firm. It was provided to allow work to be done on the "through" principle: the logs, that is to say, will enter at one end and the sawn or manufactured timber will pass out of the mill at the other. An upper floor will be used as a bending department, and a flat concreted roof above will be used for storing and seasoning timber. The plant will include two horizontal saws (one capable of cutting a log 45ins. square), three circular saws, a 12ft. by 5ft. planing and moulding machine, with the necessary frames and accessories. The machinery has been supplied by Messrs. Thomas Robinson & Son, Ltd., of Rochdale; John Pickles & Son, of Hebden Bridge, and Evans & Martin, of Liverpool.

In connection with this matter it may be mentioned that another new saw-mill is being erected in Marsh Lane, close at hand, by J. H. Lancaster & Co.



Law Cases.

A Ladder.—At the Clerkenwell County Court recently a Mrs. Graham brought an action against Messrs. Rowe & Sons, builders, for £100 damages for personal injuries sustained by the fall of a ladder being employed by the defendants in Shepherdess Walk, City Road. It was urged for the defence that the ladder was blown down by a gust of wind, and that the accident was inevitable. The judge, however, said that the accident was clearly due to negligence of the defendants' servants, and gave judgment for £21 and costs.

Right of Light Case.—At Manchester last week, before the Chancery Court of Lancashire, a right of light case was heard. The plaintiffs, Messrs. Wigglesworth, Kennedy & Wigglesworth, are the trustees of certain offices at the corner of Booth Street and Chancery Place, Manchester, and the defendants, Messrs. J. M. Dugdale Brothers, Ltd., are the owners of a piece of land on the south side of Booth Street. On this site there formerly stood a block of offices 38ft. high, which the defendants have recently pulled down, and are erecting a new block which will be 52ft. high. The plaintiffs contended that the new building would materially obstruct the light which previously had had access to the windows of their offices over the top of the old building. In consequence they alleged that their premises

would be less fit and convenient than before for use and occupation, and that their letting and selling value would be materially diminished. They therefore claimed a perpetual injunction to restrain the defendants from acting in such a manner as to injure their property, and an order, if necessary, to pull down the new building to the height of the old one, with damages and costs. The defendants denied liability.

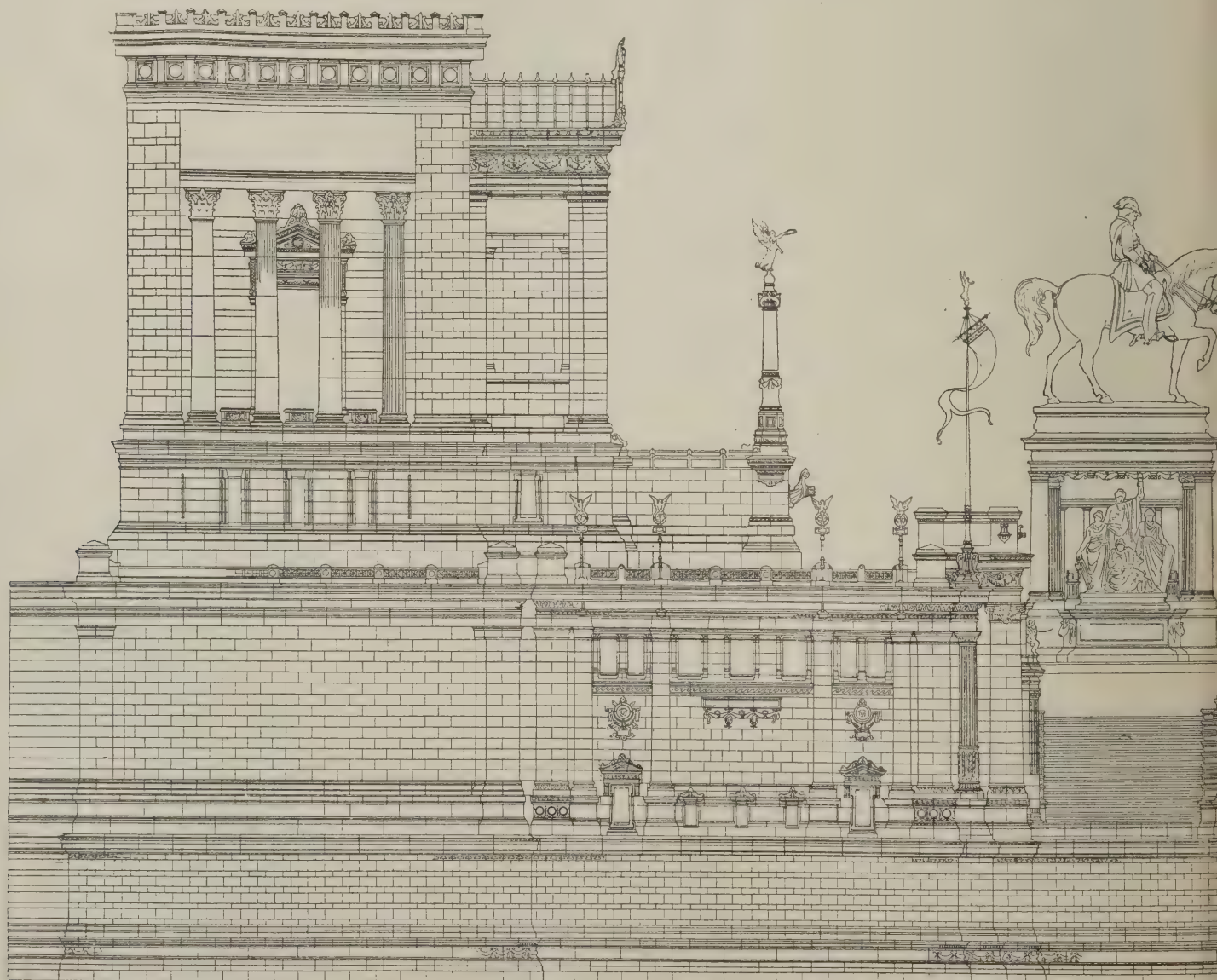
Claim in respect of Defective Kitchen Floor (*Cavalier v. Pope*, 2 K.B., 1905, p. 757).

—This is a somewhat important case, and interesting to many owners of property. The agent of the landlord of a house which had been let unfurnished, in consideration that the tenant withdrew a threat to quit, promised that the defective condition of the kitchen floor should be repaired. No repairs were done, and some time afterwards the tenant's wife met with a serious accident which arose from the defective flooring. An action was brought by the tenant and his wife against the landlord to recover damages and expenses incurred. The jury at the trial found the agent was acting within the scope of his authority, and the jury found a verdict for the plaintiffs, with damages in each case. Judgment was entered accordingly. The defendant, however, appealed from the judgment entered in favour of the wife. Held by Collins M.R. and Romer L.J., Mathew L.J. dissenting, that the female plaintiff had no cause of action in respect of the injuries sustained by her.

OUR PLATES.

IN this issue we are able to reproduce the design for the national memorial to Victor Emmanuel II., in course of erection on the Capitoline Hill at Rome. A full description of this huge work, the total cost of which down to the end of last year was about £750,000, will be found on page 238 of our issue for October 25th last. The monument is still far from complete, though more than twenty-five years have elapsed since the Italian Parliament decided on its erection. The design of Count Sacconi, the architect, was selected in competition in 1884. Count Sacconi, however, died in September last, and three Italian architects, Signori Pio Piacentini, Gaetano Koch and Manfredo Manfredi, have been appointed to continue his work. We need not now repeat the particulars which have already been given in our columns, but we would mention that included in the monument are a number of large chambers wherein the banners and other trophies of the *Risorgimento* will be kept. The cast of the horse is about to be founded in Rome.

The Tiergarten in Berlin, already overloaded by the Kaiser with statues of questionable artistic value, and nearly all of them monuments to persons whose commemoration is a matter of perfect indifference to the populace at large, is likely to be further stocked now that a sculptor has been appointed director of the Tiergarten.



NATIONAL MONUMENT TO VICTOR EMMANUEL II. IN COURSE OF ERECTION

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

Reinforced-concrete Lintels.

A. W. D. writes: "Your correspondent 'W. H. S.' having raised a question as to the reinforced-concrete lintels described in your issue for October 18th, I should like to further trespass upon the courtesy of Professor Adams to ask if he will kindly give some further explanations of his formula for calculating the strength of these lintels. For instance, it is not clear to me why the area of the parabola for the concrete in compression is taken down to the line in the tensile reinforcements. When he says that the neutral axis in the gin. by 9½ in. beams is 2.75 ins. from the centre of reinforcement, should not the height of the parabola stop at this and the effective depth of the beam and the area of concrete in compression be calculated from this?—or, in other words, how can the concrete below the neutral axis come into and be taken account of in the compression area? Why is it not necessary to take into account the shear on these lintels? What margin of safety is allowed for in taking 500 lbs. per sq. in. on coke-breeze concrete?"

The method of finding the strength of a reinforced-concrete lintel with parabola touching line through centre of reinforcement is only approximate, and not applicable to beams where the depth exceeds the width. Its object is to avoid finding the neutral axis. The second method shown on p. 221 of THE BUILDERS' JOURNAL for October 18th was that used in calculating the Kahn system, but there was a slight omission: the formula

for finding y should be $\frac{15a + bd^2}{30a + 2bd} = 3.2$;

this will make $R = 279$ ton-inches, and with a factor of safety of 4 the safe moment of resistance should be 69.75 instead of 67.84 for the larger beam and 29.1 instead of 27.75 for the smaller beam. The Prussian regulations give the following formula for finding the distance of neutral axis from upper surface

of beam: $x = \frac{nf_e}{b} \left[\sqrt{1 + \frac{2b(h-a)}{nf_e}} - 1 \right]$

where x = distance of neutral axis from upper surface of beam, n = the ratio of the coefficient of elasticity of the steel to that of

the concrete = 15, f_e = area of steel in square inches, b = breadth of beam in inches, h = depth of beam in inches, a = distance from underside of reinforcing rods to underside of beam. Then for the 9½ ins. × 9 ins. beam given on p. 221 of THE BUILDERS' JOURNAL for October 18th

$$x = \frac{15 \times 1.5}{9.5} \left[\sqrt{1 + \frac{2 \times 9.5(9 - \frac{1}{2})}{15 \times 1.5}} - 1 \right]$$

= say 4.4 ins. from top of beam. The formula for greatest compressive stress in the concrete

$$(\sigma_b) = \frac{2M}{bx \left(h - a - \frac{x}{3} \right)}, \text{ where } M \text{ is the bend-}$$

ing moment on the beam: in the above case

$$58 \text{ ton-inches. Then } \sigma_b = \frac{2 \times 58}{9.5 \times 4.4 \left(9 - \frac{1}{2} - \frac{4.4}{3} \right)}$$

= say 874 lbs. per sq. in., which though high is not unsafe. The formula for mean tensile stress in steel (σ_s)

$$= \frac{M}{f_e \left(h - a - \frac{x}{3} \right)} = \frac{58}{1.5 \left(9 - \frac{1}{2} - \frac{4.4}{3} \right)}$$

= say 5½ tons per square inch, which is well on the safe side. With regard to the shear on the lintels, the first beam will be the more liable to fail because of the higher ratio of load to sectional area. Taking the safe shear stress on the concrete at 6½ lbs. per sq. in., which is the figure allowed by the Prussian regulations, 9.5 × 9 = 85.5 sq. ins. sectional area of beam, 85.5 × 6.4 = 5490 lbs. = 2.44 tons safe shear stress. The beam carries a distributed load of 5 tons, so that the maximum shear will be $\frac{1}{2} w = \frac{5}{2} = 2.5$ tons, which will therefore be safely taken by the concrete without taking into account the stiffening effect of the steel rods. The safe load on coke-breeze concrete of 500 lbs. per square inch gives a factor of safety of 5 or 6.

HENRY ADAMS.

Colouring on Parchment.

WALES.—INTERESTED writes: "Which is the best way to colour on parchment? Hitherto I have wetted the portion to be coloured and then applied the colour, but I think this can be improved upon."

Use ox-gall with the colours, or pounce the surface as for engrossing. See "Hints on Painting," 4d. post free from our offices.

Fungus in Shop.

R. writes: "A shop was erected several years ago, with a cellar underneath most of it. It has latterly become infested with fungus, which is not confined to the shop floor, immediately over the cellar, but is spreading upwards by the walls, which are boarded to the other floors. It cannot be for want of air, for that is well provided for, nor because of extreme dampness, as the

cellar always appears dry. Can you offer a solution and a remedy?"

The floors and matchboarding should be thoroughly ventilated; and the floor boards, joists, walls and back of matchboarding should all alike be coated with "Carbolineum Avenarius," made by Messrs. Peters, Barsch & Co.

Books for Assistant Surveyors' Examination.

TEDDINGTON.—E. J. K. writes: "Please give titles and prices of books on the following subjects for assistant surveyors' examination, Office of Works:—(1) Sanitary engineer, (2) principles and practice of valuations and easements. Books concise in treatment and reasonable in price preferred. Also, what was the date of the last examination and of the previous one?"

For sanitary engineering the standard work is Moore's "Sanitary Engineering" (30s. nett), which may be accompanied by Clarke's "Plumbing Practice" (6s. nett). For valuations use the tables in Hurst's "Architectural Surveyors' Handbook" (5s.) and read Curtis's "Valuation of Land and Houses." For estimating, study Rea's "How to Estimate" (7s. 6d. nett); for easements, Innes's "Digest of Law of Easements" (7s. 6d.). The dates of previous examinations can only be found by a special search.

HENRY ADAMS.

The Theatre of Marcellus at Rome.

LONDON.—DARK HORSE writes: "Where can I find a good description and plan of the theatre of Marcellus at Rome?"

The best description of the theatre of Marcellus is contained in a book entitled "Le Theatre de Marcellus à Rome," by A. L. T. Vandoyer, and published in Paris in 1812. Some very fine drawings of this subject are given in "Architettura Antica Romana, Descritta e Dimostrata nei Monumenti," by Luigi Canina, and published in Rome in 1834. Brief descriptions will also be found in many modern works, such as I. H. Middleton's "Ancient Rome," &c. All these works will be found in the library of the R.I.B.A.

H. Y. M.

Board of Education Examinations.

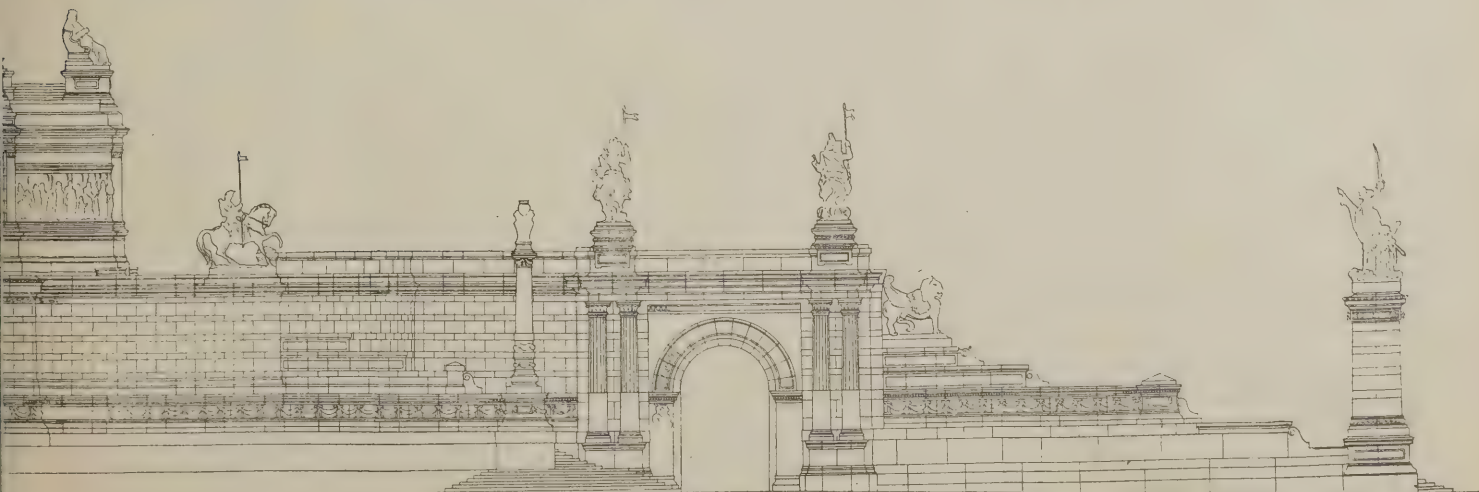
LONDON.—X. writes: "Where can I get particulars and syllabus of the examination in architecture, and honours (Part II.) building construction examination, held under the Board of Education, South Kensington?"

Apply to the secretary of the Board at South Kensington.

Buildings to Measure near Barnsley, Wakefield and Leeds.

BARNSELY.—T. B. writes: "Please name some architectural subjects suitable to measure for the Intermediate R.I.B.A. between and about the towns of Barnsley, Wakefield and Leeds."

The cathedral at Wakefield contains work

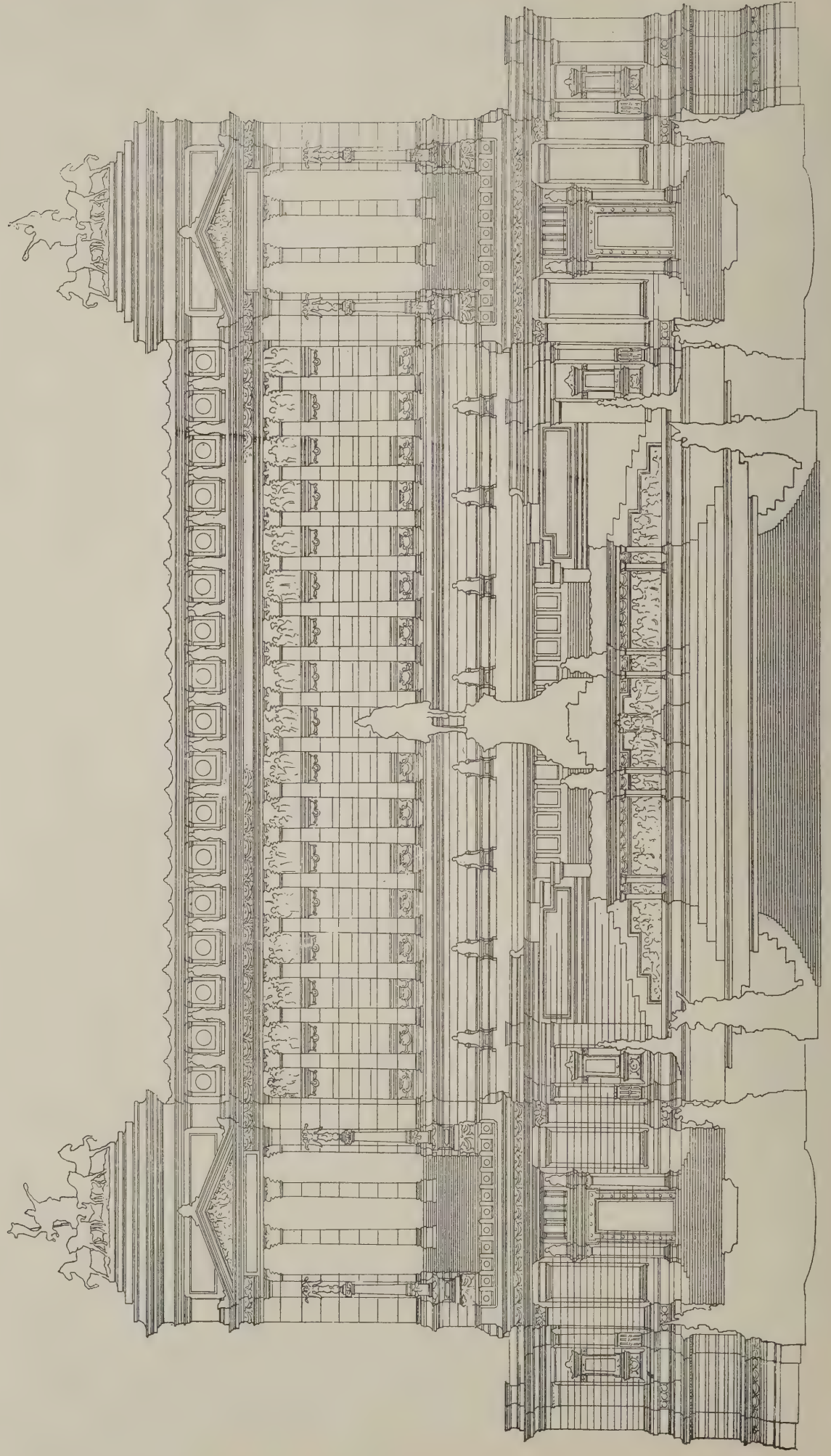


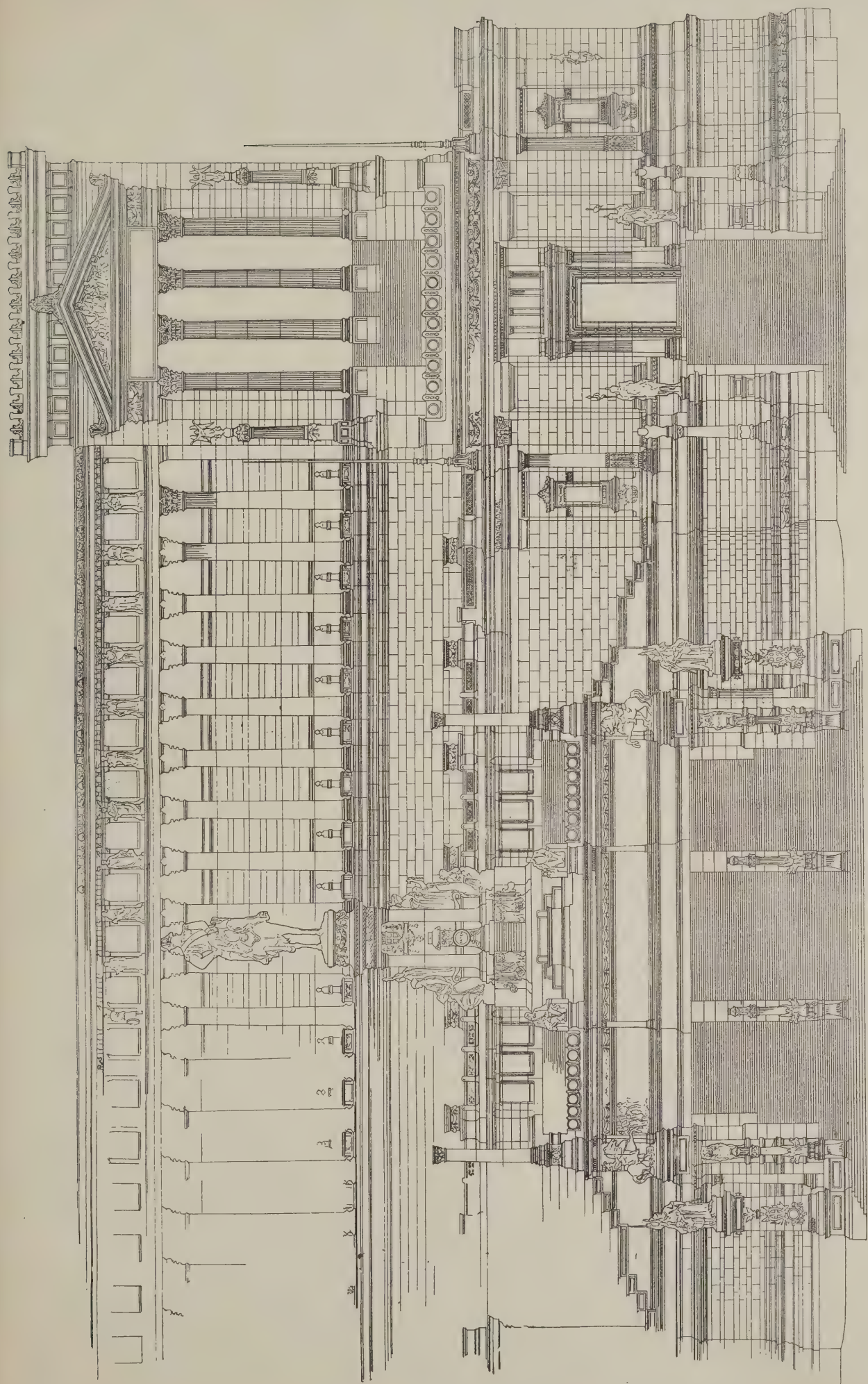
ON THE CAPITOLINE HILL AT ROME.

GIUSEPPE SACCONI, ARCHITECT.

F. S. I.

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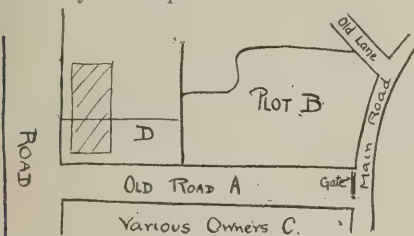


NATIONAL MONUMENT TO VICTOR EMMANUEL II. IN COURSE OF ERECTION ON THE CAPITOLINE HILL AT ROME. GIUSEPPE SACCONI, ARCHITECT.

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OF THE
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Width of New Street.

ST. ALBANS.—S. D. E. writes: "With reference to the accompanying plan of a building site for sale in a country town having urban powers, (1) could the local authorities insist on the road marked A being widened to 36ft., having regard to the fact that it has been laid out as a road for some years although never used as such, and has not been taken over by the corporation? I am not sure whether plans for this were submitted to the town council or not. (2) In the event of this being the case, I presume the width would be taken as 18ft from the centre of the roadway each side. One end of the roadway is open, but the other is blocked by a gate which is kept locked. There is, however, room enough for foot passengers to get through. (3) Is it possible by arrangement with the various adjoining owners to throw part of the present roadway A into plot B, leaving, say, a foot path next to property C as far as plot B extends or throughout the length of road A? I might add that my clients require to build one house only on the plot."



The local authorities can insist on any new street being laid out to the width of 36ft., in accordance with the by-laws, but I much doubt whether this is a new street; and if, as I suppose, the land marked "various owners C.," on your sketch consists of houses facing the A road, I am of opinion you may fairly claim that the by-law does not affect this case. (2) Not necessarily 18ft. each side of present centre. A new street must be 36ft. wide in all—however that width has to be obtained—and if the opposite owner refused to give any land you would have to widen it entirely on your side. (4) This entirely depends on the question of "dedication," and forms a rather abstruse question for a solicitor's opinion. The fact that the gate is there and has been locked is in your favour, but that is only one of the points for consideration. If you propose to enclose part of the roadway, I seriously advise you to take competent legal advice before doing anything. F. S. I.

Camera Obscura.

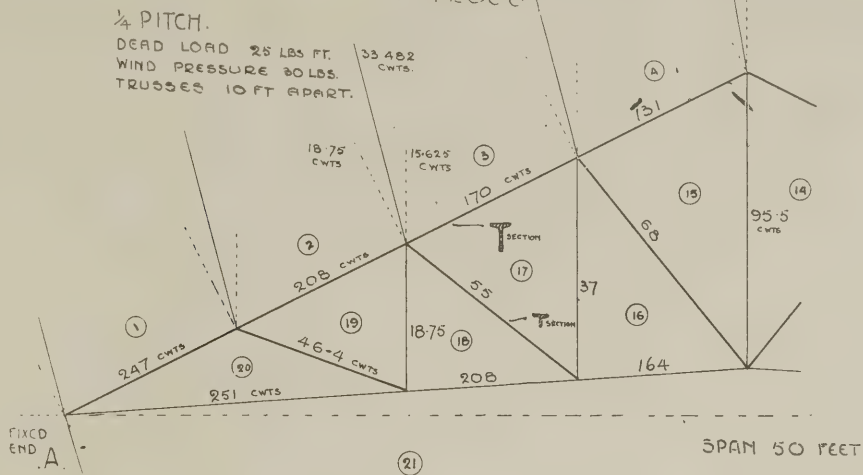
ACTION.—H. C. C. writes: "I am preparing plans, &c., for a rifle club pavilion, and am requested to arrange for a camera obscura to be fixed on the roof. Do you know of any book giving a detailed description and illustrations? Can you name any firm to whom I might apply for particulars and an estimate? Has the lens to be focussed for any definite object?"

A general description of a camera obscura may be found in many books, such as on p. 126 of Spencer's "Sound, Light and Heat" (Percival & Co.). The focus of the lens is constant. Messrs. Casella & Co., of 147, Holborn, E.C., would probably give you an estimate, and supply the lens and mirror complete. HENRY ADAMS.

Concrete Floor.

SALOP.—BEGINNER writes: "I intend to lay a concrete floor (cellar under) with rolled steel joists and a covering of wood blocks. What size H-section would be required for the dining-room floor, which measures 15ft. by 12ft., and what distance apart should the joists be? Also, what would be the approximate cost?"

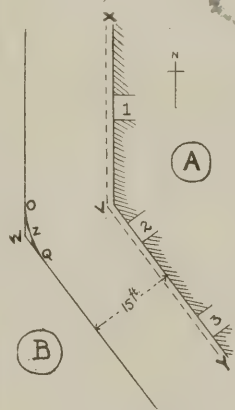
WROTH IRON ROOF TRUSS



This room is very small to have a special construction of floor, and nothing is said about provision for carrying the rolled joists, position of fireplace, &c. Assuming that this can be satisfactorily arranged, the rolled joists, with a span of 12ft., may be 5½ ins. by 2 ins. by 10½ lbs. per foot run, placed 2ft. 6 ins. centre to centre, with Portland cement concrete, 1 to 4, carefully mixed and rammed to the same depth as the joists. The cost would depend entirely upon whether the work were done by a local builder or by specialists. It might perhaps be done for 7s. 6d. per yd. super., the centering and wood-block flooring being extra, also any work in trimming round fireplaces. HENRY ADAMS.

Building Line.

HECKMONDRIKE.—EXLEY writes: "Referring to the sketch below, A is the owner by bequest of certain buildings (date of erection uncertain) whose external walls run x v y.



There is a spout (shown by dotted lines) projecting 6 ins. from the wall face, and certain windows, marked 1, 2 and 3. B buys the adjoining field on the west, and may not build within 15ft. of A's boundary. (1) In the absence of any definite plan or agreement making it indisputable, from what point is the 15ft. measurable—from the building face x, v, y, or from the overhanging spout? (There is no set-on in the wall base; the spout overhangs bodily.) (2) Should the 15ft. line be drawn parallel to x v y and v y, miting at w, or should an arc o z q be struck at 15ft. radius from v? If from the former, then A secures more than 15ft. from the point v and B suffers accordingly.

(1) "Within 15ft. of A's boundary" your question says, and if this be the correct wording of the deed B cannot build within 15ft. of any part of A's property, whether the nearest point consists of footings or spout. The exact wording of the deed or covenant must, however, govern the case. (2) I cannot say that either method is correct. It appears to be clear that no part of B's building can be nearer than 15ft. from A's boundary, and provided he does not infringe that rule he may build as he chooses. The whole matter appears to be a mere "splitting of hairs," and I advise B to be reasonable and to keep fully within his own land. F. S. I.

Sizes of Members for Iron Roof Truss.

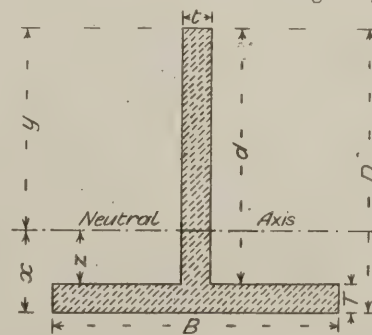
LONDON.—ENQUIRER writes: "The stresses on the accompanying diagram having been obtained graphically, how are the signs of the members calculated? My own working-out brings the sizes much above those given by Hurst."

The tables of scantlings given in Hurst's "Architectural Surveyors' Handbook" are based upon a factor of safety of 4 to 5, while the formulæ given on p. 47 are recommended to be used with a factor of safety of 10, but there stated as $\frac{1}{10}$, meaning working load $\frac{1}{10}$ of ultimate strength. If all known contingencies are allowed for, a factor of safety of 4 is sufficient for iron roofs. Box, in "Strength of Materials," even says 3 is sufficient. HENRY ADAMS.

Finding Centre Lines of Truss Members.

PLYMOUTH.—CONSTANT READER writes: "(1) How can I obtain the centre line of pressure in the members of an iron roof truss similar to that shown in one of Mitchell's sheets on building construction? On this sheet the line is shown 1775 ins. up from the lower edge of the T-principal, and all bolt-holes are made on this line. (2) Is there a sheet which can be copied as a testimony of study for R.I.B.A. Final to suit the one on constructive masonry in arches, vaults, &c.?"

Roof trusses and trussed girders should as far as possible be designed so that the lines through the centres of gravity of the cross-sections intersect at each junction and lie in the same plane. This cannot always be done, but it is an important principle to bear in mind, and is the only way to ensure direct stresses. The centre of gravity of a



T-section, as shown in sketch, is found by the formula $y = \frac{1}{2}d + \frac{\frac{1}{2}BDT}{BT + dt}$. (2) For example sheets of testimonies of study, apply to Mr. G. A. T. Middleton, 19, Craven Street, Strand, W.C. HENRY ADAMS.

A new Theatre for Dover is to be built at the rear of the Metropole Hotel and fronting New Street.

NOTES ON COMPETITIONS.

The Hackney Library Competition.

THE unsatisfactory nature of the promoters' official list of replies to competitors' questions was commented upon in these columns last week. In order to obtain, if possible, some elucidation of the points raised, a communication was addressed to the town clerk, asking:—(1) Did the Council intend to employ the successful competitor? (2) Had the president of the R.I.B.A. been asked to nominate an assessor? (3) Was not the reference to clause 4 of the conditions an error, and should it not be read as referring to clause 5? This last question, it will be remembered, was commented upon last week under the heading of "The Question of Fees," when it was pointed out that clause 4 of the conditions dealt with premiums, and not with the remuneration of the successful competitor if employed to carry out the work. The town clerk has replied: "(1) This is a matter in the discretion of the Council. (2) Not yet. The president will be asked to nominate an assessor after designs have been received. (3) The answer to question 2 should read as referring to paragraph 5 of the conditions, not to paragraph 4 as stated." Thanks are due to the town clerk for the ready manner in which he has furnished these replies, and for his reception of the enterprising competitor whose interview with him we recorded last week. This is a matter for comment and pleasurable record, when one calls to mind the instances where reasonable requests for information have been, in other cases, either treated evasively or with apparent contempt. It goes somewhat towards mitigating the uneasiness which lack of official information has caused, and it raises the hope that the verbal statement may perhaps be relied upon, namely, that there is "no reason to suppose that the Council intend to adopt any but the usual course."

One can quite understand the unwillingness of promoters to bind themselves to engage the services of an architect who might be an undesirable person—a most unlikely contingency; but had the assessor been appointed, as he should have been, before the conditions were issued, he could have shown the Council of Hackney how they might have guarded themselves, while they at the same time gave competitors a reasonable hope of being fairly dealt with. From all accounts the competition is being indulged in by many whose names are well known in connection with these architectural trials of skill, so all who are entering the lists may know that they are at least in good company.

Birmingham Council House Extension.

This double competition is now advertised. It is the biggest thing since Westminster, but the cost is not to exceed £150,000. The names of Sir Aston Webb, R.A., and Mr. E. Ingress Bell as assessors suggest an approximation to the much-desired jury of assessors, but their long association with each other in matters professional leads one to anticipate that they are likely to act as one man, though two heads are sometimes better than one. It is a pity that in a competition of this magnitude it was not possible, through the intervention of Sir Aston Webb himself and the R.I.B.A., to have arranged for the appointment of at least one other assessor, so that a full jury might have been formed in accordance with the R.I.B.A.'s latest suggestions for the conduct of competitions.

New Council Schools, King's Norton.

The Education Committee of the King's Norton and Northfield Urban District Council has issued an invitation for competitive designs for a new council school of three

departments, to accommodate 400 scholars in each department, boys, girls and infants. There is to be a professional assessor, but further information is not forthcoming at the time of going to press, for the conditions are still in the printer's hands. They will be obtainable from Mr. J. F. Moore, Education Offices, King's Norton, near Birmingham.

Proposed new School, Wrexham.

Wrexham is to have a new school at a cost of £10,000, and it has been decided to offer premiums of £50 and £30 for the best plans. It is to be hoped that Wrexham has already given its instructions to a reliable assessor or assessors, and that it is the intention to employ the successful competitor. The conditions, like those of King's Norton, are not available; possibly they have not yet been drawn up.

Hove Public Library.

The following letter has been received by ten of the competitors in this competition, which excited so much comment a few weeks ago:—

Borough of Hove.

Public Library Competition.

DEAR SIR,—I now beg to inform you that out of the seventy-one designs sent in, ten were selected for further consideration, and that on opening the sealed envelopes of these ten it is found that the design sent in by you is one of them.

The Library Committee propose to invite the authors of these ten selected designs to compete again.

I have, therefore, to enquire whether you will be willing to do this; if so, I will return your designs for that purpose.

Print of conditions, which will be settled by Mr. John Belcher, P.R.I.B.A., will follow so soon as they are ready.—Yours faithfully,

(Signed) H. ENDACOTT,
Town Clerk.

It is satisfactory to learn that, so far, the deadlock has been eased, but surely it would have been better to have given the selected ten an opportunity of seeing the new conditions before expecting them to state whether they would be willing to compete again. Further comment is out of place until the assessor's conditions for the new competition have been issued.

Competition for the Usher Hall.

At last week's meeting of the Edinburgh City Council there was a resolution on the agenda that competitive designs should be invited for the long-talked-about Usher Hall. This, however, was postponed until the town clerk's full report on the subject had been received.

Peace Palace Competition.

The term of seven months determined in article 2 of the programme of the Peace Palace competition has been extended to eight months. According to this, the plans must be in the possession of the Board of Directors of the Carnegie Foundation at the Hague (Van Karnebeek, chairman; S. Van Citters, secretary) before April 15th, 1906.

Henry Saxon Snell Prize.

Thirty-one essays on "Domestic Sanitary Appliances, with Suggestions for their Improvement," have been received by the Royal Sanitary Institute for the Henry Saxon Snell prize. Not one of the essays, however, is considered worthy of the prize, which consequently is withheld. The essayists give a good description of existing appliances, but fail in respect of suggestions for their improvement, which is the governing factor in the competition.

Extension of Mirfield Grammar School.

The design of Mr. J. Lane Fox, of Oxford Place, Leeds, has been awarded the first premium in the competition for an extension of the Mirfield Grammar School, for the Governors.

A Plymouth Competition.

It is proposed to erect a new public elementary school at Prince Rock, Plymouth, and it was suggested that a competition should be held confined to architects practising in the Three Towns. The committee, however, decided that this would be open to abuse, and decided to restrict the competition to Plymouth architects.

Correspondence.

Hackney Central Library Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—It would be a practical solution of the much-disputed assessor question if in the above and in future competitions the competitors could, through the president of the Royal Institute of British Architects, select a competent gentleman with the special knowledge necessary and a past experience of successful adjudications. Each of the competitors could send to the Institute the names of three architects with such qualifications, and the president would hand over the delicate task to the individual securing the most votes. This would remove the responsibility from this much-maligned official and save him from the temptation of doing his friend Jones a good turn, irrespective of professional knowledge.

What architects want is to be saved from the hands of the incompetent assessor. If the competitors nominated their own adjudicator they would surely protect their own interests. They could guard their future competitions if the assessor managed to get lost among the drawings and in despair took the three poorest sets sent in, as we have seen done lately; in which case his name would be so well known in the offices as to place him on the architectural black list.

To anyone conversant with public competitions it seems as if the assessor has been too often appointed because of his lack of knowledge of the requirements in the building he is called upon to assess. Numerous mistakes have been made by past-presidents of the Institute when libraries have been assessed by architects well known as specialists in church and domestic work only.

The foregoing suggestion would work better in practice than the present slack, favoured and routine method, as the remedy is in the competitors' own hands. Just one instance as proof that members are not yet blind to their own interests. A year or two ago the late architect to the London County Council assessed in the Hereford Municipal Buildings competition, which ended in a miserable fiasco. Immediately afterwards this same gentleman was appointed assessor in the Hull Town Hall competition, and when the competing architects found out who was adjudicating they failed to respond to the invitation in the face of good premiums. It had the desired effect of making the Hull Corporation appoint another assessor. The assessor should not be known to the competitors until after the designs have been submitted, as of late there has been a certain amount of pampering to the artistic fads and peculiarities of the architect whenever his name has been known beforehand. In this connection I would cite the first-premiated design for the Cheshunt Free Library, published recently in THE BUILDERS' JOURNAL. In this competition Mr. J. S. Gibson was the assessor, and the exterior of the successful scheme was strongly reminiscent of Mr. Gibson's own design for the Hull Free Library, both in detail and grouping. If competitors selected their own assessor this evil would be lessened, as there would be no need of the name being disclosed till after the award was made and the report published in full—as it ought to be, and that within two months from the sending-in day.—Yours truly,

W. EDWARDES SPROAT.

LIVERPOOL.

A Rowton House at Camden Town, fronting Arlington Road, was opened last week. The building has been erected by the company's own staff under the direction of Mr. G. J. Earle, surveyor, and to the designs of their late architect, Mr. Harry B. Measures, F.R.I.B.A., now Director of Barrack Construction.

PRESTON SECONDARY SCHOOL.

THE following are the particulars of the proposed secondary school for girls at Preston supplied to us by the architects, Messrs. Woolfall & Eccles, of Liverpool. The design was illustrated in our issue for last week:—

This building is divided into two departments by a corridor 12ft. wide running from north to south the full width of the building. On the east side of same is the central hall, with classrooms, laboratory, lecture-room, sixth-form room, &c. On the west side are the headmistress's and assistant mistress's rooms, with their lavatories, small office and store, scholars' cloakroom, space for changing, caretaker's room and main staircase. An auxiliary staircase is also provided. On the upper floor over this portion are the kitchen, scullery and dining-room, and over the scullery the music and practice rooms. The entrance to the school is from Moor Park, and an exit is provided to St. Thomas's Road. In the basement a playroom is provided with storage for bicycles. The approach is from the playground down an inclined way, and also from the ground floor under the main staircase, and leading out of the covered way from the school to the yard, so that scholars can reach same in bad weather without going outside the building. The heating is also provided for in the basement. On the first floor are five separate classrooms, exclusive of the cookery-room and art room. This latter has a north light. The wide corridor is repeated on this floor, and will be suitable for exhibits. It also disconnects the cookery and dining-room, &c., from the other part of the school. At the south end of the corridor is a small conservatory. The w.c.'s are on the St. Thomas's Road side, kept back from the road, approached from the playground and also from the school under cover through an arcaded corridor. The playground is on the west side.

Trade and Craft.

Gas Heating.

No doubt it is the experience of the majority of our readers that the ordinary gas fire often has the great objection of emitting noxious fumes. Therefore a flue is generally insisted upon to carry off the products of combustion. This however means that the gas fire loses its efficiency, because it is an established fact that air is not warmed by radiation but by convection or conduction. Convected heat is the chief source of warmth, and is that kind which is conveyed from one place to another by the actual transference of the heated substance, such as heated air. Air only becomes heated by contact with heated particles or heated surfaces, and thus radiant heat from an open fire only warms a room by warming the furniture or walls and using them as an intermediary. In the gas fire with flue the radiant heat is not very much. The gas fire gains its real efficiency by warming the air by contact with the heated products of combustion, i.e., by convection. For this to be done it means that there must be no smell due to the incomplete combustion of the gas, and only by doing without a flue can we gain economy in gas heating. The "Omega" gas stove has the advantage of securing perfect combustion, which renders it odourless (as is testified by many authorities) and requires no flue; and these stoves have the additional advantages of not drying the air and not "roaring" as other stoves do. There are many circumstances where flues cannot be adopted, and heating is nevertheless required at times. Here these stoves offer a solution of the difficulty. They are made by The Omega Odourless Gas Stove Co., Ltd., of Cave Street, Bristol.

Keystones.

Architects' Benevolent Society.—In relief this year £842 has been distributed.

Hammernsmith Workhouse and Infirmary.—Mr. Thomas Rowbotham, of Birmingham, was the contractor for this large scheme, of which some particulars were given on p. 330 of our issue for last week.

The Institute and Registration.—Early next year it is hoped to call a special meeting of the Institute to receive the report on registration drawn up by the council and the registration committee.

Stained-glass Studio at Hove.—Mr. E. E. Oldacre, formerly in responsible positions with Messrs. Henry Hope & Sons, Ltd., and earlier with Messrs. Walter J. Pearce, Ltd., is now established at Stirling Place, Hove, Sussex, where he has studios for the preparation of stained and leaded glass and similar decorative work. The style of the firm is "E. E. Oldacre & Co."

Extension of the Building Act.—From the report of the Building Act Committee submitted to the London County Council yesterday it appears that the Amendment Act passed this year, which comes into operation on January 1st, will require about 10,000 buildings to be dealt with, and a rearrangement of the superintending architect's department will have to be made in order to cope with the extra amount of work entailed. Several assistants are to be advanced.

Messrs. Waygood's Athletic Association Dinner.—At the London Tavern in Fenchurch Street on Saturday evening there was a very large and enthusiastic gathering to celebrate the eighth annual dinner of the Athletic Association of Messrs. R. Waygood & Co., Ltd., the well-known lift firm. An attractive programme was provided, and under the chairmanship of Mr. R. Percy Sellon (and subsequently of Mr. D. W. R. Green) a most enjoyable evening was spent. During the evening the prizes won in the course of the season were presented by the chairman, who was able to announce that the Association had been able to secure a private ground for cricket, football, tennis, &c.

Collapse of a Wall at Croydon.—On Tuesday last week a wall of the new Palace of Varieties in course of erection at Croydon collapsed, killing one man and injuring nine others. The music-hall is being rebuilt, and the outer walls of the original structure were left standing to be embodied in the new work. It was one of these old walls (32ft. high) which fell, having collapsed at a point about 15ft. above the ground where chases had been cut in the brickwork to receive a girder. In falling the old wall struck a new wall running parallel to it at a distance of about 6ft. and caused a part of this to fall also. The contractor for the work is Mr. Walter Wallis, of Balham. At the inquest the jury returned a verdict of accidental death, adding that it was to be regretted more precautions in the way of shoring up had not been taken.

Royal Academy Students' Prizes.—The Royal Academy gold medal and travelling studentship (value £200) for a design for a British embassy in a foreign capital is won this year by Mr. Leslie Wilkinson, who also secures the price of £25 for a set of architectural designs. Measured drawings (silver medal), 1st, A. A. Carter; 2nd, A. E. Brooker. Set of drawings of an architectural design, 1st (£15), A. A. Carter; 2nd (£10), W. Harvey. Design for the decoration of a portion of a public building—"Commerce"—prize £40, J. H. Amschwartz; honorable mention, C. A. C. Oliver Lodge. The prizes offered for perspective drawing in outline and for architectural design with coloured decoration were not competed for.

R.I.B.A. NOVEMBER EXAMINATIONS.

Pass List.

THE following is the pass list in the Preliminary, Intermediate, and Final Examinations of the Royal Institute of British Architects which were held in London and the provinces in November:—

Preliminary Examination.

This examination, qualifying for registration as probationer R.I.B.A., was held in London and the undermentioned provincial centres on November 7th and 8th. Of the 210 candidates admitted, 46 claims for exemption from sitting for the examination were allowed. The remaining 164 candidates were examined, with the following results:—

District.	Number examined.	Passed.	Relegated.
London	82	67	15
Birmingham	5	2	3
Bristol	3	6	2
Cardiff	14	12	2
Leeds	17	12	5
Manchester	24	13	6
Newcastle	14	11	3
	164	128	36

The following passed candidates, with those exempted—numbering altogether 174—have been registered as probationers:—

A. Adam (Paisley)	G. V. Hawker (Bournemouth)
C. A. Aish (Kingston-on-Thames)	J. Hayhurst (Blackburn)
E. M. Armstrong (Pretoria)	G. E. Hedley (South Shields)
C. F. Bailey (Walsall)	G. M. Hedley (Cullercoats)
A. L. Ball (Birmingham)	J. Hill (Newcastle-on-Tyne)
B. V. Bartholomew (Walthamstow)	G. W. Home (London)
F. C. Barrett (N. Finchley)	H. R. Hooper (Ipswich)
F. K. Barry (Richmond)	J. H. Horniman (St. Leonards)
A. Berrington (Birkenhead)	L. W. Ingham (Leicester)
H. C. Berry (London)	E. R. Jarrett (London)
J. A. Bessant (London)	B. Johnston (Plymouth)
W. S. Beits (Clapham)	J. Johnston (Longtown)
H. D. Blacker (Clifton)	F. S. G. Judd (Windsor)
H. Blenkinsop (Sheffield)	C. S. Kimpton (Wandsworth)
H. Boddington (Wilmslow)	A. Lakeman (London)
G. Boshier (Merthyr Tydfil)	G. Law (Ware)
C. W. Box (Beeston)	C. H. Ledger (Epsom)
D. W. Boyd (Belfast)	A. J. Lee (London)
A. G. Brace (Knowle)	W. L. B. Leach (Ipswich)
J. S. Bray (Exeter)	S. T. Leete (Weston-super-Mare)
W. J. Burton (New Cross)	G. E. G. Leith (London)
C. F. Butt (London)	W. J. Lewis (Ferndale)
R. W. Cable (Brixton)	L. S. Littlejohn (Eccles)
C. S. Cameron (Aberdare)	B. H. Lodge (Putney)
F. E. Cannon (Lincoln)	P. N. Logan (Bristol)
G. R. Carter (Leicester)	W. H. Louw (London)
W. Carter (Sunderland)	C. E. Lovick (Crowthorne)
H. F. Castle (London)	A. M. Lusby (Fareham)
E. S. Chivers (Amphill)	D. R. Lyne (Cheltenham)
R. Church (Glasgow)	D. McLean (Corbridge-on-Tyne)
A. N. Clark (Southsea)	L. D. Maddox (Llanishen)
W. L. Clark (Petersfield)	B. F. Matthews (London)
W. E. Clarke (Ewell)	R. H. Mattocks (Windermere)
C. F. Clarkson (Kensington)	J. W. Mawson (Windermere)
W. H. Clough (Gateshead)	H. G. McCoy (High Wycombe)
A. J. C. Cooper (Henfield)	D. L. Meckleham (Hamstead)
L. L. Corkhill (Ramsey)	S. Mercer (Blackburn)
F. L. Crampton (Newark)	H. J. Midson (Crouch End)
H. A. Crooke (Acton)	S. E. Minns (Hull)
L. A. Culliford (Ealing)	H. E. Moore (Ealing)
K. Dalglish (London)	F. W. Moore (Keighley)
C. T. Davidson (South Shields)	C. J. Moorehead (Manchester)
G. S. Davies (Swansea)	E. E. Morgan (Crouch End)
V. R. Davis (Aberdare)	H. J. Murphy (Cork)
D. J. S. Dawson (Barking)	A. E. Newbound (Newark)
W. Dean (Lewisham)	W. W. Nimmo (Gosforth)
F. Dowdeswell (Palmer's Green)	A. T. Nicholson (Bolton)
G. S. Dransfield (Barnsley)	W. H. Ogden (Wakefield)
H. Dye (Portsmouth)	G. Parkinson (Burnley)
D. N. Dyke (London)	T. L. Pearce (London)
E. H. M. Ebbs (Harsleden)	A. N. Peckham (Westminster)
W. F. Edge (Edgbaston)	R. M. Pigott (Wandsworth Common)
J. A. Emes (Balham Hill)	F. C. Plummer (Liverpool)
A. E. Evans (Ferndale)	F. W. Pocock (Egham)
W. H. Fielding (Cardiff)	J. J. Price (Clifford)
E. Fillingham (Bradford)	L. M. Pritchard (Beaumaris)
G. W. Filliter (Higher Broughton)	W. S. Putwin (East Dulwich)
N. Fisher (Leeds)	O. B. Raven (Gainsborough)
A. Forbes (Reading)	R. G. Rice (Derby)
G. S. Ford (Nottingham)	H. E. Richards (Ilford)
G. Forsyth (London)	V. Rienecker (Kensington)
W. S. Foster (Hull)	H. Roderick (Aberdare)
W. T. Garbutt (Bradford)	M. S. Rogers (Flint)
R. E. Gaskell (Hull)	W. Royde (Stoke-on-Trent)
W. W. Gibbins (Reading)	G. H. Russell (Hitchin)
A. Gibbs (Moseley)	
S. Grabbam (Sunderland)	
M. A. Hall (Lincoln)	
F. M. Hammond (Bradford)	
H. Harper (Handsworth)	
J. S. Harrison (Bolton)	
J. C. Harvey (Northampton)	
W. H. Hattersley (Cambridge)	

E. P. P. Samuels (Llan-fairfechan)	E. J. Thomas (Maesy-cwmmer)
E. Sanders (High Wycombe)	W. H. Thompson (Blackpool)
S. P. Schooling (Enfield)	R. J. Thomson (Arbroath)
E. W. B. Scott (Norwich)	G. L. Thorne (Southampton)
B. W. H. Scott (Enfield)	A. Tinker (Pendleton)
C. J. G. Seddon (West Hampstead)	A. T. Tippetts (South Woodford)
A. E. Shapley (Newcastle)	A. E. V. Tutte (Portsmouth)
R. H. Simmons (Southampton)	A. E. Vey (Chiswick)
T. A. Skinner (Bristol)	D. H. Walker (Bridlington)
C. V. Smith (Tunbridge Wells)	S. P. Walker (Newark)
S. Smith (West Hartlepool)	A. Waller (Bradford)
C. L. Souster (Gorleston)	F. G. Walmsley (Blackburn)
F. D. Sowerby (London)	R. Williams (Menai Bridge)
P. N. Steadham (Fareham)	G. S. Wodeford (Tilehurst)
F. H. Swindells (Hampstead)	F. Woodward (Hampstead)
M. J. Tapper (London)	F. C. Wyld (Clapham)
A. P. Thomas (Bridgend)	O. Wyn (Port Dinorwic)
	W. C. Young (Heaton Moor)

The Intermediate Examination.

qualifying for registration as student R.I.B.A., was held in London and the under-mentioned provincial centres on November 7th, 8th, 9th and 10th. 131 candidates were examined, with the following results:—

District.	Number examined.	Passed.	Relegated.
London	82	37	45
Bristol	9	6	3
Leeds	19	8	11
Manchester	21	14	7
	131	65	66

The passed candidates, who have been registered as students, are as follows, the names being given in order of merit as placed by the Board of Examiners:—

J. R. Truelove (Sheffield)	J. W. Hays (Wingate)
R. I. Smith (Weston-super-Mare)	G. A. S. Atack (Blackburn)
W. R. Dawson (Halifax)	P. S. Brenton (Bath)
W. T. Benslyn (Oldbury)	R. G. Burrow (Old Trafford)
J. Woolatt (Wiltord)	A. E. Catt (Kingston-on-Thames)
C. V. Hodges (Leicester)	J. H. Chaudler (East Sheen Avenue, S.W.)
H. V. M. Emerson (Chiswick)	R. R. Christen (Bolton)
R. Evans (London)	F. J. Coghlan (Cheltenham)
E. Ainsworth (Blackburn)	K. L. Collingwood (Richmond)
C. B. Metcalfe (Bradford)	R. A. Dixon (Birmingham)
F. D. Thomson (Dundee)	R. K. Ellison (Huntingdon)
C. G. Boucher (London)	J. R. Goulston (Sydenham)
F. H. Bromhead (Harrow)	J. B. Healing (Hampstead)
J. F. Schofield (London)	H. W. Higson (Bolton)
F. Wade (Bradford)	G. H. Jones (Cardiff)
E. G. Allen (S. Woodford)	G. G. King (Belfast)
C. Bristow (W. Norwood)	D. C. Leigh (Winstord)
J. Allner (Manchester)	T. C. Little (Carlisle)
H. C. Anderson (Heywood)	W. P. Major (Bristol)
F. J. Osborne (Birmingham)	A. C. Meston (Chiswick)
H. E. Dicks (Cheltenham)	C. Oldrey (Plumstead)
S. W. Mobbs (Oulton)	T. M. Richards (Barnes)
D. Whittaker (St. Helen's)	B. H. T. Rodd (Winton, Bournemouth)
C. E. Curphey (Douglas)	J. W. Snaft (Petersfield)
E. J. Scaife (Bolton)	H. N. Smith (Lewisham Hill)
A. Braewell (Keighley)	G. Unsworth (Petersfield)
F. D. Ward (Hasings)	A. Wheatley (Barnsley)
E. Finn (Canterbury)	H. J. Wilson (Peterborough)
J. H. Willman (Wellingborough)	J. D. Winder (Wandsworth Common)
J. Davaston (Ealing)	E. M. Wood (Halifax)
C. E. Hanscomb (Ladywell)	A. M. C. Young (London)
C. H. Hoy (Manchester)	
W. G. Shaw (Blackburn)	
D. S. Gardner (Weston-super-Mare)	

Exemptions.

Mr. H. H. Hill, of Cork, and Mr. H. Thornton, of Dewsbury, probationers, having attended the full course in architecture at University College, Liverpool, and having obtained a first-class certificate at the College Final Examination, were granted exemption from sitting for the Intermediate Examination, and have been registered as students R.I.B.A.

The Final and Special Examinations.

qualifying for candidature as Associate R.I.B.A., were held in London from November 17th to 24th. Of the 90 examined, 45 passed, and the remaining 45 were relegated to their studies. The successful candidates are as follows:—

*A. W. Addison (Cambridge)	F. Dyer (Manchester)
A. D. Aitken (Airdrie)	T. S. Fraser (Hamilton)
J. H. de Caynoth Ballarrie (London)	*W. C. Green (London)
A. F. Benjamin (London)	E. L. Hampshire (Streatham)
J. Boyle (Bolton)	G. Hanson (Bradford)
J. E. Braithwaite (Leeds)	*C. H. Holden (Weymouth)
S. Bridges (London)	*A. Hunter (Colwyn Bay)
A. E. Bullock (Chiswick)	A. H. Lamont (Edinburgh)
*M. Bunney (London)	*L. W. C. Lorden (Hythe)
J. Cocker (Altrincham)	W. P. Marr (Kingsbridge)
T. T. Cumming (Reading)	W. K. McDermott (London)
E. J. Dixon (Staitford)	D. Mitchell (London)
B. Drummond (London)	*H. A. Moon (London)
	G. Morland (Croydon)

H. S. Morran (London)	J. H. Shearer (Exeter)
*A. R. Myers (Edinburgh)	P. M. Stratton (Upper Mitcham)
A. C. Noley (London)	J. R. Sykes (London)
D. M. O'Connor, B.A., B.E. (London)	*P. Turner (Bradford)
*A. J. Peyton (Welling)	*M. O. Type (Birmingham)
S. C. Ramsey (Herne Bay)	R. F. Wheately (Bromley)
W. H. Riley (Leicester)	E. C. M. Willmott (London)
H. Ryle (Brookley)	L. S. Wood (Wood Green)
*D. A. Shaw (Camden Road, N.W.)	H. E. Woodsend (Nottingham)

The following table shows the number of failures in each subject of the Final Examination:—

I. Design	31
II. Mouldings and Ornaments	22
III. Building Materials	12
IV. Principles of Hygiene	6
V. Specifications	11
VI. Construction: Foundations, &c.	11
VII. Construction: Iron and Steel, &c.	19

Colonial Examinations.

Final and Special Examinations were held by the Institute during July last at Sydney, New South Wales, and at Durban, South Africa. The examination at Sydney was conducted by the Institute of Architects of New South Wales, and the examination at Durban by the Natal Institute of Architects. Mr. E. A. Agutter, of Pietermaritzburg, and Mr. *J. Barr, Public Works Department, Sydney, were examined and passed.

* These candidates entered for the Special Examination, which is for architects in practice not less than twenty-five years of age, and chief assistants over thirty. Such candidates are exempted, by special resolution of the Council, from the Preliminary and Intermediate Examinations, and from submitting "Testimonies of Study."

Obituary.

Mr. James Green, F.S.I., of the firm of Weatherall & Green, surveyors and auctioneers, of 22, Chancery Lane, London, died last week. During a practice extending over a period of forty-six years Mr. Green acted as one of the consulting valuers to the Government, the Corporation, the London County Council and many other public and private corporations and companies in London and the provinces.

Mr. John Weller, senior partner in the firm of John Weller & Sons, architects and surveyors, Wolverhampton, died on November 27th, in his seventy-sixth year. He served his articles with the late Mr. Edward Banks, of Wolverhampton, and afterwards spent some years in London, commencing practice in Wolverhampton fifty years ago and continuing to take an active interest in the firm up to the time of his death. For the past thirty-three years he held an appointment as surveyor to Earl Dartmouth, Patshull Estate, and for the past twenty-seven years as surveyor to the Wolverhampton and District Permanent Building Society. Mr. Weller never took any active part in public life, but was very well known and highly esteemed. He leaves a widow, daughter and two sons.

Mr. H. H. Armstead, R.A., the well-known sculptor, died last week, aged 79. His two most important works were the sculptured decorations on the Colonial Office in Whitehall and the southern and eastern sides of the podium of the Albert Memorial; for the latter he designed eighty-four life-sized figures in marble, representing the musicians, poets, sculptors and painters of the Italian, German, French and English Schools, and other "ideal" statues. He did the external stone sculptures at Eaton Hall, Warwickshire, the carved oak panels in "The Queen's Robing Room" at Westminster Palace, the marble rétrods in Westminster Abbey, the great fountain in King's College, Cambridge, the statue of Lieut. Waghorn at Chatham, and numerous statues and busts. "His work had monumental character and simplicity, and will always be remembered as belonging to the front rank of British sculpture," says Mr. M. H. Spielmann.

Current Market Prices

FORAGE.			
		£ s. d.	£ s. d.
Beans	per qr.	1 13 0	1 15 0
Clover, best	per load	3 12 0	4 0 0
Hay, good	do.	3 5 0	3 10 0
Sainfoin mixture	do.	3 7 0	3 15 0
Straw	do.	1 8 0	1 14 0

OILS AND PAINTS.

Castor Oil, French	per cwt.	1 1 10	1 2 15
Colza Oil, English	do.	1 4 6	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 15 0	2 17 0
Lead, white, ground, carbamate	per ton	16 0 0	—
Do. red	do.	15 0 0	0 19 0
Linseed Oil, barrels	per cwt.	0 18 3	—
Petroleum, American	per gal.	0 0 7½	0 0 7½
Do. Russian	do.	0 0 6½	0 0 6½
Pitch	per barrel	0 8 0	—
Shellac, orange	per cwt.	9 2 0	—
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Town	per cwt.	1 6 3	—
Tar, Stockholm	per barrel	1 5 0	—
Turpentine	per cwt.	2 5 6	—

METALS.

Copper, sheet, strong	per ton	91 0 0	—
Iron, Staffs., bar	do.	6 15 0	8 10 0
Do. Galvanized Corrugated sheet	do.	12 0 0	12 5 0
Lead, pig, Soft Foreign	do.	16 5 0	—
Do. do. English common brands	do.	16 10 0	—
Do. sheet English, 3lb. per sq. ft. and upwards	do.	17 0 0	—
Do. pipe	do.	17 10 0	—
Nails, cut clasp, 3in. to 6in.	do.	9 5 0	—
Do. floor brads...	do.	9 0 0	—
Steel, Staffs., Girders and Angles	do.	6 15 0	7 5 0
Do. do. Mild bars	do.	7 5 0	7 10 0
Tin, Foreign	do.	162 0 0	162 10 0
Do. English ingots	do.	165 0 0	166 10 0
Zinc, sheets, Silesian	do.	31 7 6	—
Do. do. Vieille Montaigne	do.	31 10 0	—
Do. Spelter	do.	28 15 0	28 17 6

TIMBER.

Soft Woods.			
Fir, Dantzic and Memel	per load	2 15 0	5 0 0
Pine, Quebec, Yellow	do.	4 2 6	7 10 0
Do. Pitch, American	do.	2 19 0	5 0 0
Laths, log, Dantzic	per cu. fath.	4 0 0	6 0 0
Deals, Archangel, Yellow, 1st and 2nd, 3 x 11	per std.	18 10 0	—
Do. do. do. 2nd, 3 x 9	do.	15 0 0	—
Do. St. Petersburg, 1st, 3 x 10	do.	9 0 0	—
Do. do. do. 1st, 3 x 9	do.	11 5 0	—
Do. do. do. 3rd, 3 x 11	do.	7 10 0	—
Do. do. do. Unsorted, 2½ x 8	do.	8 10 0	—
Do. Petschora, Yellow, 2nd, 3 x 11	do.	14 10 0	—
Do. do. do. 2nd, 3 x 9	do.	13 10 0	—
Do. Kovta, Yellow, 4th, 3 x 9	do.	8 15 0	—
Do. Räfsö, Yellow, 1st, 3 x 9	do.	14 10 0	14 15 0
Do. do. do. 2nd, 3 x 9	do.	12 0 0	—
Do. Keret, Yellow, 2nd, 3 x 9	do.	15 0 0	—
Do. Umba, Yellow, 4th, 3 x 9	do.	9 5 0	—
Do. Quebec, Spruce, unsorted, 1st, 2nd & 3rd, 3 x 9	do.	8 15 0	—
Do. do. do. 3rd, 3 x 9	do.	9 0 0	—
Do. Holmsund, Yellow and White, 3 x 9	do.	6 2 6	—
Do. do. Yellow, 3 x 4½	do.	5 7 6	—
Do. Marsons, Spruce, Unsorted, 3 x 8	do.	8 10 0	—
Do. do. do. 3 x 7	do.	8 5 0	—
Do. Nederkalix, Yellow, 3rd, 3 x 4½	do.	7 10 0	—
Do. Skelleftea, Yellow, Unsorted, 3 x 3½	do.	6 10 0	—
Battens, all kinds	do.	6 10 0	9 10 0
Flooring Boards in. prepared, 1st...	per square	0 9 3	0 14 0
Do. 2nd	do.	0 8 3	0 9 9
Do. 3rd, &c.	do.	0 7 3	0 8 0

HARD WOODS.

Ash, Quebec	per load	4 0 0	7 15 0
Birch, New Brunswick	do.	2 7 6	4 10 0
Do. Quebec do.	do.	2 12 6	5 0 0
Box, Turkey	per ft. sup.	7 0 0	20 0 0
Cedar, Cuba	do.	0 0 3	0 4
Do. Honduras	do.	0 0 6½	—
Do. Tobasco	do.	0 0 5½	—
Elm, Quebec	per load	4 5 0	8 10 0
Jarrab, plank	per ft. cu.	0 2 6	0 3 0
Mahogany, Average Price for Cargo, Honduras...	per ft. sup.	0 0 5½	—
Do. Tobasco	do.	0 0 5½	—
Do. Cuba	do.	0 0 4½	—
Do. African	do.	0 0 3½	—
Oak, Wainscot	per log.	3 15 0	7 5 0
Teak, Indian, logs	per load	10 0 0	19 0 0
Do. do. planks	do.	13 0 0	20 0 0
Whitewood, American, logs	per ft. cu.	0 1 3	0 1 6
Do. do. planks and boards	do.	0 1 3	0 3 0

Tenders.

1 Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C.

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Blackburn.—For the erection of a new post-office at Blackburn, for the Commissioners of H.M. Works, &c.:—
Credit.

J. Parkinson & Sons	£12,531	14	8	—
R. Neill & Sons	12,500	0	0	£125
W. Thornton & Son	11,981	0	0	—
J. Knowles	11,775	0	0	65
E. Whewell	11,480	0	0	45
J. Boland	11,100	0	0	50
Marshall & Dent	11,000	0	0	42
J. Fecitt & Sons	10,980	0	0	45
W. Livesey	10,900	0	0	50
E. Lewis & Sons	10,745	0	0	50
T. Higson & Sons	10,446	0	0	50
J. Cronshaw	10,250	0	0	50
W. J. Woolf Cronshaw & Sons*	10,200	0	0	70

* Accepted.

Burslem.—For the erection of a new school of art, for the Corporation. Messrs. A. R. Wood & Son, architects, Burslem and Tunstall:—

S. Wilton	£7,090
Yorke & Goodwin	6,995
W. Cooke	6,944
J. Gallimore	6,815
J. Grant	6,650
T. Godwin	6,583
W. Grant & Sons,* Burslem	6,500

* Accepted.

Burslem.—For the erection of a new Congregational Church, for the Trustees. Messrs. A. R. Wood & Son, architects, Burslem and Tunstall:—

Yorke & Goodwin	£3,850
T. Godwin	3,849
J. H. Broadhurst	3,810
J. Cooke	3,800
C. Cornes	3,799
J. Grant	3,791
W. Grant & Sons,* Burslem	3,749
W. Cooke	3,721

* Accepted.

Croydon.—For the erection of a new central fire station at Park Lane, for the Town Council:—

B. E. Nightingale, London, S.E.	£13,379	0	0
Limpus & Son, Surbiton	13,012	11	7
Smith & Sons, South Norwood	12,860	0	0
H. Kent, Hither Green	11,685	0	0
Keen & Son	10,924	6	8
Grace & March	10,473	15	4
Rosland Brothers, Horsham	10,399	0	0
Moss & Sons, Loughborough	10,185	10	4
W. Roberts	9,871	0	0
Chapman & Sons	9,842	18	9
G. Everitt	9,700	0	0
Marriott & Salter, Caterham	9,500	0	0
J. Barker & Co., Kensington	9,489	0	0
Bulled & Co.	9,471	0	0
Bacon & Son, Thornton Heath	9,437	7	0
Longley & Co., Crawley	9,335	0	0
D. W. Barker	9,254	0	0
Lawrence & Son, Waltham Cross	9,248	0	0
Gathercole Brothers, Norbury	9,207	0	0
W. Potter	9,066	0	0
Wallis & Sons, Maidstone	8,976	0	0
W. Smith & Sons	8,746	0	0
Hudson & Co.,* London, S.W.	8,575	0	0

* Accepted. [Rest of Croydon.]

Grays.—For alterations and additions to Palmer's Endowed Schools, for the Governors. Mr. Christopher M. Shiner, A.R.I.B.A., architect and surveyor, 6, 7 and 8, Crutched Friars, E.C., and Grays. Quantities by Mr. G. Silvester, 46, Strand, W.C.:—

G. Brown	£13,878
F. G. Minter	12,600
W. Potter	12,400
W. H. Archer	12,269
F. J. Coxhead	11,947
W. Manders	11,938

T. Rowbotham	£11,707
T. Bruty	11,700
Sabey & Sons	11,550
F. & E. Davey	11,378
J. Brown	11,335
Hammond & Sons	11,329
H. J. Carter	10,927
C. Wall, Ltd.*	10,409

* Recommended for acceptance.

Guildford.—For the formation of Middleton Road, on the Woodbridge Estate, Guildford. Messrs. Houston & Houston, A.R.I.B.A., architects and surveyors, 1, Long Acre, W.C., and 148, High Street, Guildford:—

Cunningham, Forbes & Co., Fleet	£1,697	0	0
Musselwhite & Sapp, Basingstoke	1,689	0	0
Hewett & Sons, Barking	1,644	16	10
James Smith & Sons, Ltd., South Norwood	1,630	17	3
Samuel Atkins, Kingston-on-Thames	1,607	0	0
James & Hebburn, Guildford	1,554	0	0
Stephen Kavanagh & Co., Surbiton	1,525	0	0
James May, Ashstead	1,500	0	0
A. Streeter & Co., Godalming	1,477	18	9
G. A. Franks, Guildford	1,473	0	0
Edwards & Co.,* London	1,430	0	0

* Accepted.

Hull.—For the erection of school buildings in Villa Place, for the Education Committee. Mr. Joseph H. Hirst, city architect, Town Hall, Hull:—

Hull General Builders	£16,990
Bowman & Sons	15,148
H. T. Arnott	15,089
J. Simpson & Sons	14,860
G. Scores	14,792
G. Longden & Sons, Sheffield	14,750
J. Houlton & Sons	14,750
J. H. Fenwick	14,705
G. Houlton	14,545
F. Southern	14,540
T. Beilby	14,297
C. Greenwood	14,133
T. Goates	14,047
E. M. Darneley	13,838
G. H. Pantin	13,700
Hockney & Iagins, Witham	13,649
Hebblewhite & Wilson	13,625
J. Levett	13,565
M. Harper,* Brunswick Avenue, Hull	13,434

* Accepted. [Rest of Hull.]

London, W.—For the erection of the proposed six blocks of working-class flats, thirty-six two-room suites in all, on the south side of Kenley Street, for the Kensington Borough Council:—

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W. Johnson & Co.	10,145
R. A. Lowe	10,079
Holliday & Greenwood	9,977
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I. H. Bywaters	9,900
Leslie & Co.	9,860
F. & G. Foster	9,720
H. L. Holloway	9,668
C. F. Kearley	9,634
Cowley & Drake	9,576
B. E. Nightingale	9,572
W. Taylor & Co.	9,497
F. Webster & Son	9,415
Martin, Wells & Co.	9,400
D. F. Lamplough	9,371
J. Chessum & Sons	9,370
F. Gough & Co.	9,334
A. Hudson & Co.	9,300
J. Appleby & Sons	9,220
W. Lawrence & Son	9,149
J. Barker & Co.	8,730
J. Garrett & Son	8,650
C. Gray	8,250
E. J. Clayton	8,000
Chambers Brothers*	7,575

[Architect's estimate, £6,886.]

* Recommended for acceptance.

London, W.—For the work and materials required in the construction of a new bridge over the Grand Junction Canal at Old Oak Lane (near Willesden Junction), in the district of Acton, for the Light Railways and Tramways Committee of the Middlesex County Council:—

Pedrette & Co.	£6,850	10	6
W. H. Hyde	6,840	0	0
J. Cochrane & Sons	6,305	0	0
R. H. B. Neal, Ltd.	6,208	0	0

T. Turner	£6,182	4	0
Tilbury Construction Co.	6,066	11	0
C. Ford	5,955	0	0
Kellett, Ltd.	5,568	1	7
T. Almond & Son	5,450	0	0
A. Fasey & Co.	5,365	5	7
H. Woodham	5,356	13	4
W. Manders	5,275	4	5
Muirhead, Greig and Matthews	5,071	18	0
S. Kavanagh & Co.	4,950	0	0
A. Thorne	4,928	2	0
J. T. Firbank	4,920	4	8
C. Wall & Co.	4,900	0	0
Edwards & Co.	4,817	7	11
Wilkinson Brothers	4,806	0	0
J. Strachan	4,721	0	9
D. Davies, Ball & Co.	4,669	16	0
Radford & Greaves*	4,325	0	10

* Accepted.

Nuneaton.—For the erection of a house in Newdegate Place, for Mr. T. J. Lilley. Mr. Ernest E. Shepherd, architect, New Bridge Street, Nuneaton:—

T. Smith	£919
W. Green	882
T. Wincott*	883

* Provisionally accepted.

Queen's Ferry.—For the erection of an elementary school, to accommodate 300 children, at Queen's Ferry, Flintshire, in accordance with plans, &c., approved of by the Board of Education, for the Education Committee. Mr. Samuel Evans, county surveyor and architect, Mold:—

A. White & Sons, Liverpool	£4,400	4	0
J. Salt, Buxton	4,203	0	0
Fox & Parry, Queen's Ferry	4,076	6	7
J. E. A. Whitehouse Brothers, Queen's Ferry	4,027	8	8
J. Downham, Widnes	3,988	10	3
P. Edwards, Chester	3,895	0	0
E. J. Mills, Chester	3,743	0	0
A. B. Lloyd, Flint	3,703	0	0
J. Challinor, Saltney	3,600	15	7
E. Blane & Sons, Connah's Quay	3,600	0	0
G. Roberts & Brothers, Llandudno	3,591	0	0
Hughes & Stirling, Bootle	3,580	0	0
G. Wright & Sons, Chester	3,549	10	0
T. Huxley, Malpas	3,500	0	0
R. Williams, Brymbo, Wrexham	3,499	10	0
J. Johnson, Wrexham	3,489	15	0
H. Kelly & Brothers, Liverpool	3,474	0	0
J. Wood & Co., Colwyn Bay	3,495	0	0
J. Mayers & Son, Chester	3,384	5	0
E. O. Probert,* Hope Village	3,324	2	2
M. S. Rogers, Flint	3,289	16	10

* Accepted. † Withdrawn

Shrewsbury.—For the erection of a corrugated-iron isolation hospital, on foundations to be otherwise provided, for the Visiting Committee of the Salop and Montgomery Asylum. Mr. A. T. Davis, M.I.C.E., engineer, Shire Hall, Shrewsbury:—

F. Ritchie & Sons, Belfast	£2,765	0	0
R. Carr & Co., London, E.C.	2,559	7	10
W. A. Baker & Co., Newport, Mon.	2,100	0	0
Hill Brothers, Mansfield	2,075	0	0
E. C. & J. Keay, Birmingham	1,853	0	0
J. Harrison & Co., Camberwell	1,851	0	0
Harrison Smith Buildings, Birmingham	1,825	0	0
J. Hitchen & Son, Halifax	1,800	0	0
Bruce & Still, Liverpool	1,762	0	0
C. Leather & Sons, London, S.W.	1,650	0	0
R. Iles, Ltd., Waltham Green, S.W.	1,639	0	0
C. Leather, Wandsworth, S.W.	1,605	0	0
J. McManus, London, W.	1,555	0	0
Foundry and Engineering Co., Alnwick	1,543	0	0
J. Mitson & Co., Camberwell, S.W.	1,525	0	0
Young, Tinker & Young, Manchester	1,515	0	0
Humphreys, Ltd., Hyde Park, S.W.	1,497	0	0
Portable Building Co., Manchester	1,451	0	0
W. Harbrow, London, S.E.	1,417	0	0
Construction Co., Darlington	1,410	0	0
Boulton & Paul, Norwich	1,362	0	0
Norton Brothers & Co., Ilford	1,350	0	0
J. Hawkins & Co., Ashford	1,349	0	0
F. Smith & Co., London, E.	1,314	0	0
Ginger, Lee & Co.,* 35, Richmond Grove, East Longsight, Manchester	1,249	4	0

* Accepted

(Continued on page xviii.)

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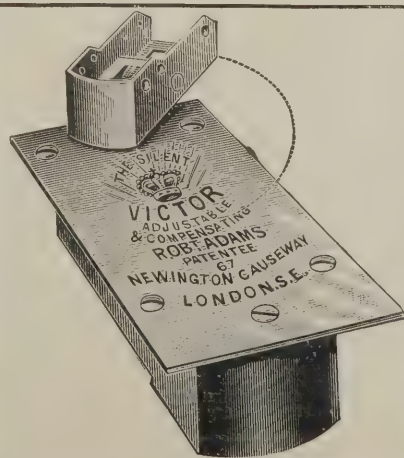
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Secretary for Higher Education.

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EMPLOYMENT REGISTER.

Too late for Classification.

- 1536.—PERSPECTIVES executed, effectively and artistically.
- 1537.—ARCHITECT'S ASSISTANT (24); working drawings, details, quantities; good designer and colourist.
- 1538.—PLUMBER'S FOREMAN (35); thoroughly experienced in all branches; quick and reliable; town or country; good refs.
- 1539.—ARCHITECT AND SURVEYOR'S ASSISTANT; capable designer and draughtsman; thorough knowledge of construction; 11 yrs. exp., hotels, domestic chapels, &c.
- 1543.—GENERAL FOREMAN (45); wide and varied exp.; carpenter and joiner; 9 yrs. last berth.

See p. xx for the Employment Register.

NOTICE TO OUR SUBSCRIBERS.

THE INDEX OF "THE BUILDERS' JOURNAL."

The Title Pages and Index to any volume of "THE BUILDERS' JOURNAL" may be had free, upon application being made to the Office, Great New Street, enclosing 1d. stamp to cover postage of same.

Competitions Open.

CITY OF BIRMINGHAM.
COUNCIL HOUSE EXTENSION.
TO ARCHITECTS.

The Lord Mayor and Corporation of the City of Birmingham are desirous of EXTENDING the present MUNICIPAL BUILDINGS, and invite ARCHITECTS to submit DESIGNS for the same.

Sketch Plans only are required to be sent in by MARCH 31, 1906, and from those submitted a selection of not less than six nor more than ten will be made, the authors of the selected designs receiving each an honorarium of 100 guineas upon submitting complete Designs in a final competition amongst those so selected.

The Corporation has appointed Sir ASTON WEBB, R.A., and Mr. E. INGRESS BELL to act for them as their Professional Advisers in this competition.

Particulars of conditions, with Plan of Site, &c., can be obtained on the payment of One Guinea (to be returned to bona fide competitors), on application to the Town Clerk, Council House, Birmingham.

Contracts Open.

TO BUILDERS AND CONTRACTORS.

The Board of Guardians of the CLUTTON UNION hereby invite TENDERS for:—

A. Certain ALTERATIONS AND REPAIRS to the WORKHOUSE INFIRMARY, BOYS' LAVATORY, CLOTHING STORE AND OFFICES.

B. THE ERECTION OF NEW VAGRANT WARDS. Forms of Tender, with copies of Bills of Quantities, will be forwarded on application to the Architect, and the Plans and Specifications may be seen on application to the Master at the Workhouse, or at the office of the Architect, Mr. WILLIAM F. BIRD, Midsomer Norton, Somerset, from whom any further information may be obtained.

Sealed Tenders, duly endorsed, must be delivered to me at my office on or before TUESDAY, 9th January next.

The Guardians do not bind themselves to accept the lowest or any Tender.

J. SUMNER BURY,
Clerk to the Guardians.
Temple Cloud, Bristol.
9th December, 1905.

WEST SUFFOLK COUNTY COUNCIL. TO BUILDERS.

SHIRE HALL, BURY ST. EDMUNDS.
West Suffolk County Council are prepared to receive TENDERS for ALTERATIONS AND ADDITIONS to SHIRE HALL, Bury St. Edmunds.

Builders wishing to Tender must send in their names and addresses to the undersigned.

Builders selected to Tender will be supplied with a copy of the Bill of Quantities on depositing £5, which will be returned on receipt of a bona fide Tender.

Plans, Specifications, and a copy of the Form of Contract may be inspected at the Temporary Offices, 5, Crown Street, Bury St. Edmunds, or at the Offices of the County Architect, Sudbury and Bury St. Edmunds, on or after the 1st JANUARY, 1906.

Sealed Tenders to be delivered to me on or before TUESDAY, the 16th day of January, 1906.

The Committee do not bind themselves to accept the lowest or any Tender.

A. AINSWORTH HUNT, M.S.A.,
County Architect,
Sudbury,
Suffolk.

December 4th, 1905.

THE URBAN DISTRICT COUNCIL OF SOUTHGATE.

MAKING-UP OF PRIVATE STREETS.

TENDERS are invited for the Making-up of YORK, NATAL, and OAK ROADS at Bowes Park, within the Council's district.

Plans may be seen on application to the Council's Surveyor, Mr. C. G. LAWSON, from whom copies of the Specification and Forms of Tender may be obtained on depositing £2, which will be returned on receipt of a bona fide Tender.

Tenders, endorsed "Private Streets," must reach the undersigned not later than TWELVE o'clock at Noon, on MONDAY, the 18th day of December instant.

The Council do not pledge themselves to accept the lowest or any tender.

W. M. ELLENOR,
Clerk of the Council.
Council Offices, Palmer's Green, N.,
5th December, 1905.

OUR METHOD OF ADVERTISING A "WANT"

not only brings results, but it saves you expense.

We give three insertions of an advertisement for the price of two, and in addition we tabulate the particulars you send under a special heading in the Employment Register, and keep it there for *six weeks* free of any extra charge.

Thus for 3s. a four line advertisement appears in two places in our paper, and your "want" is advertised for six weeks.

We know this is generous treatment, but we think when a man is out of a situation it is a time when a little generosity is appreciated. The letters we have already received from those who have taken advantage of this scheme point clearly to the truth of this, and we are glad to know that the Employment Register has already helped many to find good positions.

The only condition we make is that immediately an appointment is obtained we are advised in order that we may take the number and name off the Register, thus saving waste of space.

All advertisements for next week must reach this office not later than 5 o'clock on Monday, the 18th inst.

The Employment Register in this number appears on page xx.

Property & Land Sales.

Re Gray & Co., 26, Sanglew Road, Catford, S.E.
MESSRS. HENRY W. FIGG & SON will SELL by AUCTION, on the PREMISES, on MONDAY, DECEMBER 18th, 1905, and following day, at TWELVE o'clock, the nearly new STOCK-IN-TRADE OF BUILDERS' IRONMONGERY, comprising hocks, nails, screws, brass foundry, iron barrel and fittings, R.W. goods, kitcheners, self settlers, tile and other stoves, chimney pieces, sanitary ware, tiles, &c., also a useful spring van, high trap, iron safe, a platform machine to weigh 5 cwt.
Catalogues of the AUCTIONEERS, 128A, Queen Victoria Street, E.C.

THE ROYSTONS ESTATE, Beckenham
Road, Kent House. - LAND to be LET, on ninety-nine years' building lease. Approved builders financed. Solicitor's and surveyor's charges low. - Full particulars of Messrs. ARTHUR ALDRIDGE & Co., F.A.I., Cromwell House, 6, 8, and 9, Surrey Street, Strand, W.C. Telephone: 4729 Gerrard.

NEW FOREST (on the borders).—To be SOLD or LET, on building lease, a FREEHOLD SITE, about 4½ acres, beautifully situated near good town. Within easy reach of the Isle of Wight; two and a half hours on main line from London. Stands high. Handsome timber. Good frontages to two roads. Suitable for one or more houses.—Apply to Messrs. NEWMARCH & ROBERTS, Land Agents, 61, Lincoln's Inn Fields, London.

5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS.
OFFICE: 6, GREAT NEW STREET, FETTER LANE. E.C.

Complete List of Contracts Open.

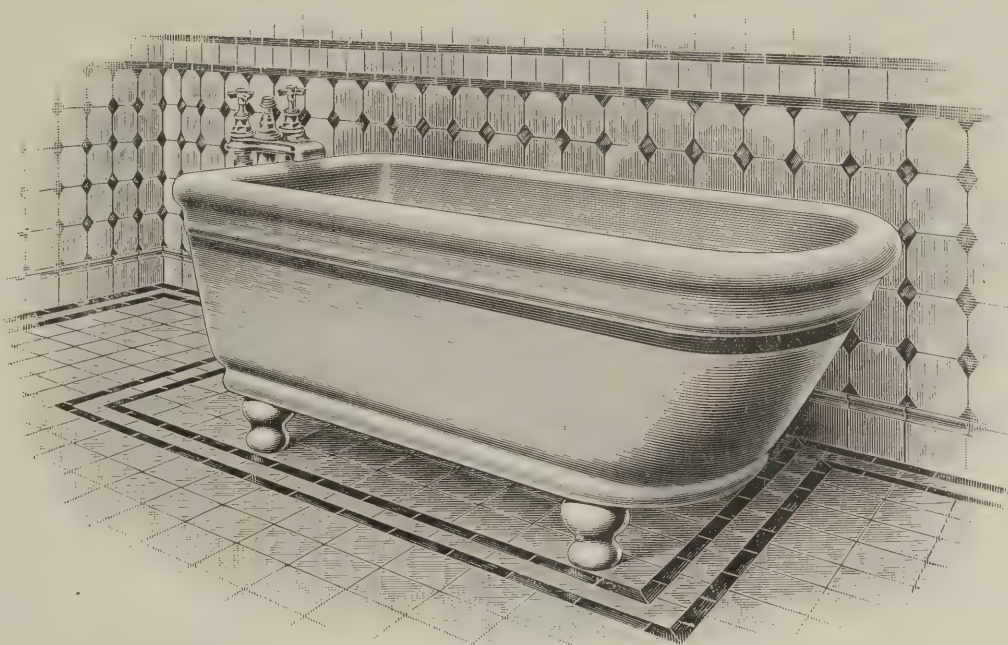
DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :			
Dec. 14	Aberdare—Houses	Building Club	T. D. Williams, Secretary, 10 Canon Street, Aberdare.
" 14	Bridlington—Glazed Tiling	Town Council	Borough Surveyor, Town Hall, Bridlington.
" 15	Preston—Farmhouse	Corporation	Borough Surveyor, Town Hall, Preston.
" 15	Bromley—Convenience	County Council	Superintending Architect's Department, 15 Pall Mall East, S.W.
" 15	Edinburgh—Convenience	Council	Borough Engineer, Edinburgh.
" 16	Burntwood—School	Education Committee	Education Offices, Stafford.
" 16	Hull—Alterations, &c.	Asylum Committee	Joseph H. Hirst, City Architect, Town Hall, Hull.
" 16	Tredegar—Alterations	Education Committee	David Morgan, Architect, Charles Street Chambers, Cardiff.
" 18	West Hartlepool—Storey	J. W. Cameron & Co.	Golden Lion Hotel, Stockton Street, West Hartlepool.
" 18	Coventry—Shed	Gas Committee	Fletcher W. Stevenson, Engineer, Gasworks, Coventry.
" 19	Southwick—School	Education Committee	Brown & Spain, Architects, 12 John Street, Sunderland.
" 19	Kirton—School	Managers	J. Rowell, Architect, Church Lane, Boston.
" 19	Rugby—Enlargement of Sorting-office	H.M. Office of Works	Secretary, H.M. Office of Works, Storey's Gate, S.W.
" 19	London, W.—Roofing	Great Western Railway Co.	Engineer, Paddington Station, W.
" 20	Boughton Monchelsea—School Enlargement	Education Committee	Ruck & Smith, Architects, 86 Week Street, Maidstone.
" 20	Crumlin and Abersychan—Alterations	School Managers	H. S. Griggs, Architect, Newport, Mon.
" 20	Haverfordwest—Additions, &c.	Education Committee	D. Edward Thomas, Architect, 17 Victoria Place, Haverfordwest.
" 20	Molgrove—Additions, &c.	Education Committee	D. Edward Thomas, Architect, 17 Victoria Place, Haverfordwest.
" 21	Gateshead—Fire-brigade Station	Town Council	N. Percy Pattinson, Borough Engineer, Town Hall, Gateshead.
" 21	Bradford—Post-office Enlargement	H.M. Office of Works	Secretary, H.M. Office of Works, Storey's Gate, S.W.
" 28	Blackley—Infirmary, &c.	Guardians	T. Worthington & Son, Architects, 46 Brown Street, Manchester.
" 30	Preston—School	Education Committee	Education Offices, Lancaster Road, Preston.
" 30	Docking—Repairs	Guardians	J. Morris, Surveyor, Dorset House, Heacham.
" 30	Llandaf and Dinas Powis—Hospital	Rural District Council	J. H. James, 18 Quay Street, Cardiff.
1906.			
Jan. 3	Newport—Extension, &c.	Gas Co.	T. Canning, Engineer, Gasworks, Mill Street, Newport, Mon.
" 5	Llandilo—Additions and Alterations to Council School	Carmarthenshire Education Committee	W. D. Jenkins, M.S.A., M.R.S.I., County Education Architect, Shire Hall, Carmarthen.
" 5	Bryndu—Additions and Alterations to Council School	Ditto	Ditto.
" 5	Brynamman—Heating Apparatus and Repairs at Council School	Ditto	Ditto.
" 5	Bettws—Repairs to Council School	Ditto	Ditto.
" 5	Hillfield—Ventilation and Folding Partitions at Council School	Ditto	Ditto.
" 5	Castle—Ventilation, Lighting and Repairs at Council School	Ditto	Ditto.
" 9	Bungay—School	Education Committee	A. Pells, Architect, Beccles, Suffolk.
" 11	Lancaster—Town Hall	Corporation	E. W. Mountford, Architect, 17 Buckingham Street, Strand, W.C.
" 16	Bury St. Edmunds—Alterations, &c.	County Council	A. Ainsworth Hunt, County Architect, Sudbury.
ENGINEERING :			
Dec. 16	Lisnaskea—Well	Rural District Council	J. O'R. Hoey, Clerk, District Council, Lisnaskea, Ireland.
" 16	Earlestown—Engine	Urban District Council	R. T. Surtees, Engineer, Waterworks, Newton-le-Willows.
" 18	Abergwynn—Heating Plant	County Council	Glamorgan County Offices, Westgate Street, Cardiff.
" 18	Glasgow—Crane, &c.	Trustees	G. H. Baxter, Engineer, 16 Robertson Street, Glasgow.
" 19	London, S.W.—Bridge	L. & N.W. and G.W. Joint Railways.	Engineer, Paddington Station, W.
" 27	Elham—Superheater and Boiler	Guardians	R. Lonergan, Clerk, 11 Cheriton Place, Folkestone.
1906.			
Jan. 9	Auckland—Wharf, &c.	Harbour Board	W. & A. McArthur, 150 Leadenhall Street, London, E.C.
" 10	Southsea—Pier Extension	Pier Company	A. H. Bone, Engineer, 148 High Street, Portsmouth.
May 1	Talcahuano, Chili—Dock		Direccion de Material, Valparaiso.
IRON AND STEEL :			
Dec. 14	Bradfield—Fencing	Education Committee	F. Whitmore, County Architect, 73 Duke Street, Chelmsford.
" 15	Christiania—Plates	Norwegian State Railway	Commercial Intelligence Branch, Board of Trade, 73 Basinghall Street.
ROADS AND CARTAGE :			
Dec. 14	Margate—Excavation	Gas Co.	Frank A. Winstanley, Engineer and Manager, The Danes, Margate.
" 15	Maidstone—Materials	County Council	County Surveyor, Maidstone, Kent.
" 18	Hendon—Road Widening, &c.	Urban District Council	S. Slater Grimley, Engineer, Council Offices, Hendon, N.W.
" 18	Meriden—Granite	Rural District Council	A. Seymour, Clerk, 11 Priory Street, Coventry.
" 18	Perth—Causewaying, &c.	Town Council	Robert M'Killop, Burgh Surveyor, Perth.
" 18	Reading—Road Materials, &c.	County Council	J. F. Hawkins, County Surveyor, Bank Chambers, Cross St., Reading.
" 19	London, S.E.—Aberdeen Pitchers	Borough Council	F. Royall, Town Clerk, Bermondsey Town Hall, Spa Road, S.E.
" 23	Harpندن—Street Works	Urban District Council	John H. Leverton, Public Hall, Harpenden, Herts.
" 30	Horsham—Materials, &c.	County Council	W. McIntosh, County Surveyor, 22 Worthing Road, Horsham.
SANITARY :			
Dec. 15	Sunbury-on-Thames—Sewage Mains, &c.	Urban District Council	H. F. Coales, Surveyor, Council Offices, Sunbury-on-Thames.
" 18	Hendon—Pipe-sewer	Urban District Council	S. Slater Grimley, Engineer, Council Offices, Hendon, N.W.
" 18	Settle—Sewerage Works	Rural District Council	Barber, Hopkinson & Co., Engineers, Craven Bank Chambers, Keighley.
" 18	Spennymoor—Disinfectants	Urban District Council	Sanitary Inspector, Silver Street, Spennymoor.
" 20	Great Crosby—Sewer	Urban District Council	Watkin Hall, Surveyor, District Council Offices, Great Crosby.
" 21	Tiverton—Sewage-disposal Works	Borough Council	J. Siddalls, Borough Engineer, Tiverton.
" 24	Alderley Edge—Catchpit Gulleys, &c.	Urban District Council	J. Newton, Son & Bayley, Engineers, 19 Cooper Street, Manchester.
" 27	Brynmenyn—Scavenging, &c.	Urban District Council	H. Dawkin Williams, Surveyor, Council Offices, Brynmenyn.
1906.			
Jan. 2	Hove—Drainage Works	Town Council	H. Hamilton Scott, Borough Surveyor, Hove.
" 4	Kishton—Sewage-disposal Works	Urban District Council	C. J. Lomax, Engineer, 37 Moss Street, Manchester.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	DEPOSIT REQUIRED FOR CONDITIONS, &c.	FROM WHOM PARTICULARS MAY BE OBTAINED.
1906.				
Jan. 31	Hackney—Library	50, 30 and 20 guineas	£1 is.	W. A. Williams, Town Clerk, Town Hall, Hackney.
Feb. 15	Wrexham—Schools (W. E. Willink, Assessor)	£50, £30		Clerk to Education Committee, Wrexham.
Mar. 31	Birmingham—Council House Extension (Sketch Plans).		£1 is.	Town Clerk, Council House, Birmingham.

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VITREOUS BODY & TRUTHFULNESS
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TENDERS - cont. from p. xiii.

London, S.E.—For providing a partition in the babies' room, including the provision of a stove, air-shaft, &c., at the Chaucer School, Bermondsey, for the London County Council. Mr. T. J. Bailey, education architect:—
J. Appleby & Sons, Cornwall Works, Lambeth £143
J. F. Ford, 89, Fitzalan Street, Kennington Road 129
W. J. Coleman & Co., Wynne Road, Brixton W. Downs, Hampton Street, Walworth Road 124
W. V. Goad, 241, Camberwell Road 120
J. C. Chalkley, 42, Grange Road, Bermondsey 120
W. H. Lascelles & Co., 121, Bunhill Row 118
J. Marsland & Sons, 1, York Street, Walworth 117
Galbraith Brothers, 46, Camberwell Green 112
Holliday & Greenwood, Ltd., Loughborough Park Works, Brixton 108
T. D. Leng, Czar Street Works, Evelyn Street, Deptford 96
* Recommended for acceptance.

London, S.E.—For dividing rooms A and B in the infants' department of the Page's Walk School, Bermondsey, into three rooms, forming a lobby, &c., for the London County Council. Mr. T. J. Bailey, education architect:—

H. Bouneau, 1A and 2, Royal Victor Place, Old Ford Road, £252 10 0
W. J. Coleman & Co., Wynne Road, Brixton, 250 0 0
W. Downs, Hampton Street, Walworth Road 242 0 0
J. Appleby & Sons, Cornwall Works, Lambeth 237 0 0
W. H. Lascelles & Co., 121, Bunhill Row 229 0 0
J. Marsland & Sons, 1, York Street, Walworth 228 0 0
Holliday & Greenwood, Ltd., Loughborough Park Works, Brixton 223 0 0
R. Johnson, 60, Beulah Road, Thornton Heath, 221 0 0
Galbraith Brothers, 46, Camberwell Green 210 0 0
T. D. Leng, Czar Street Works, Evelyn Street, Deptford 205 0 0
J. C. Chalkley, 42, Grange Road, Bermondsey 201 0 0
L. Whitehead & Co., Ltd., Portland Place North, Clapham Road 196 0 0
* Recommended for acceptance.

Pontshonorton.—For the erection of a new boys' school, to accommodate 250 pupils, for the Pontypridd Urban District Council. Mr. P. R. A. Willoughby, A.M.I.C.E., surveyor:—

Lewis & Davies, Tonyrefail £4,404 6 2
C. Jenkins & Sons, Porth, 4,150 0 0
D. Davies, Cardiff, 3,996 16 5
F. Bond, Cardiff 3,950 0 0
E. B. Smith Jones, Pontypridd 3,944 13 7
J. E. Evans, Cardiff 3,772 14 6
T. F. Howell, Cardiff 3,716 9 5
E. R. Evans Brothers, Gwentyth Street, Cathays, Cardiff, 3,598 12 4
[Surveyor's estimate, £3,600.]
* Accepted.

Poplar.—For the erection of a car-shed, for the London County Council:—

C. Yates & Co., London £39,994 0 0
F. & G. Foster, London 39,100 0 0
H. Kent, London 39,024 0 0
A. Faulks, Loughborough 35,830 2 7
Kirk & Randall, London 35,637 0 0
W. H. Hyde, London 35,566 0 0
Martin, Wells & Co., Ltd., Aldershot 24,400 0 0
Perry & Co., London 33,875 0 0
F. & H. Higgs, London 32,750 0 0
J. Shelbourne & Co., London 32,487 0 0
Rowley Brothers, Tottenham 32,349 0 0
Holliday & Greenwood, Ltd., London 32,333 0 0
F. & T. Thorne, London 32,200 0 0
T. Rowbotham, Birmingham 32,197 0 0
G. Munday & Sons, London 31,565 0 0
A. Hudson & Co., London 31,536 0 0

H. Lovatt, Ltd., London £31,282 0 0
F. & A. Willmott, Ilford 31,082 0 0
B. E. Nightingale, London 30,420 0 0
J. C. Bowyer, London 30,258 0 0
Holloway Brothers, Ltd., London 30,190 0 0
C. Wall, Ltd., London 29,006 0 0
* Recommended for acceptance.
[Architect's estimate, £29,500.]

Woolwich.—For various works at the Powis Street special school, Woolwich, for the London County Council. Mr. T. J. Bailey, education architect:—

W. Harris, Steam Joinery Works, North Woolwich £432
Thomas & Edge, Anglesea Avenue, Woolwich 427
E. P. Builed & Co., Strathmore Road, Croydon 399
Vigor & Co., King Street, Poplar 365
Kirk & Randall, Warren Lane Works, Woolwich 363
H. Groves, Stockwell Street, Greenwich 356
H. Line, St. Peckham Rye, 333
Enness Brothers, Erith, Kent 274
* Recommended for acceptance.

Coming Events.

Wednesday, December 13.

NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. T. Preston on "Italian Art and Travel," at 7.30 p.m.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. L. G. Mouchel on "Feito-concrete Construction," at 8 p.m.
INSTITUTE OF SANITARY ENGINEERS.—Annual Dinner, Holborn Restaurant, at 6 p.m.

Thursday, December 14.

SOCIETY OF ARCHITECTS.—Mr. J. R. Manning on "Cheap Houses for Rural Districts," at 8 p.m.
T-SQUARE CLUB.—General Meeting, Café Monico, at 5.45 p.m.
MANCHESTER SOCIETY OF ARCHITECTS.—Mr. C. H. Heathcote on "Some Lessons from American Methods," at 6.45 p.m.

Friday, December 15.

INSTITUTION OF MECHANICAL ENGINEERS.—Meeting at 8 p.m. Discussion on Alloys. Mr. E. G. Izod on "The Behaviour of Materials of Construction under Pure Shear."
ARCHITECTURAL ASSOCIATION.—Mr. W. H. Bidlake on "Church Towers and Spires," at 7.30 p.m.
BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. J. A. Gotch on "The Homes of Queen Elizabeth's Courtiers," at 6.45 p.m.
JUNIOR INSTITUTION OF ENGINEERS.—Prof. J. T. Morris, M.I.E.E., on "Electrical Mains for Power Transmission," at 8 p.m.
INSTITUTION OF CIVIL ENGINEERS.—Mr. E. E. Mann on "Tests of Street Illumination in Westminster," at 8 p.m.
LONDON TOPOGRAPHICAL SOCIETY.—Mr. Philip Norman on "The Roman Wall of London," at 4.30 p.m.
GLASGOW TECHNICAL COLLEGE ARCHITECTURAL CRAFTSMEN'S SOCIETY.—Discussion on "The Relative Duties of the Various Building Contractors," at 8 p.m.

Saturday, December 16.

JUNIOR INSTITUTION OF ENGINEERS.—Visit to the Electrical Engineering Works of Messrs. Johnson & Phillips, Old Charlton, at 10 a.m.

Monday, December 18.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Messrs. A. Gascoyne and A. J. Dix on "Stained Glass," at 8 p.m.

Tuesday, December 19.

MANCHESTER SOCIETY OF ARCHITECTS.—"Impromptu Debates," at 6.30 p.m.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Associates' Annual Dinner.
ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—Mr. Francis Bond on "Bay Design in the English Mediæval Churches," at 7.30 p.m.

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THE BUILDERS' JOURNAL

AND ARCHITECTURAL RECORD.

December 20, 1905. Vol. 22, No. 567.

6, Great New Street, Fetter Lane, E.C.

Summary.

Working drawings for factory buildings, more especially for steelwork, should be profuse in details and notes. Nothing in the way of constructional details should be left to the tender mercies of the contractor or the elastic conscience of his foreman. All dimensions should be carefully and fully figured on the drawings. (Page 349.)

In a paper on towers and spires which he read before the Architectural Association last Friday Mr. W. H. Bidlake said that as Northamptonshire and Lincolnshire, with Peterborough as centre, were the home of the spire, so Somersetshire, with Glastonbury or Wells as centre, developed the most important school of tower design. With regard to illustrations, it was difficult, unless one was content with minor examples, to find any which had not been given in "Wicke's Towers and Spires," which since its publication in 1855 had remained the standard work on the subject. (Page 355.)

The late Mr. A. W. Mills, architect, of Manchester, has left £8,000 to the Manchester Society of Architects for the establishment of a home of its own. (Page 357.)

A standard specification for steel for bridges and building construction is to be published shortly. (Page 360.)

Two more unsatisfactory competitions are recorded. (Page 358.)

A portfolio of measured drawings by students of the school of architecture at Liverpool University is proposed to be published yearly, price 12s. 6d., under the direction of Professor Reilly. (Page 357.)

The old T-square club has been wound up and a new one is to be formed. The annual subscription will be one guinea. (Page 358.)

A reredos is proposed to be erected in King's College Chapel, Cambridge, from designs by Messrs. Detmar Blow & Fernand Billerey. At St. Michael's, Leeds, a new reredos by Mr. Temple Moore has been erected. (Page 352.)

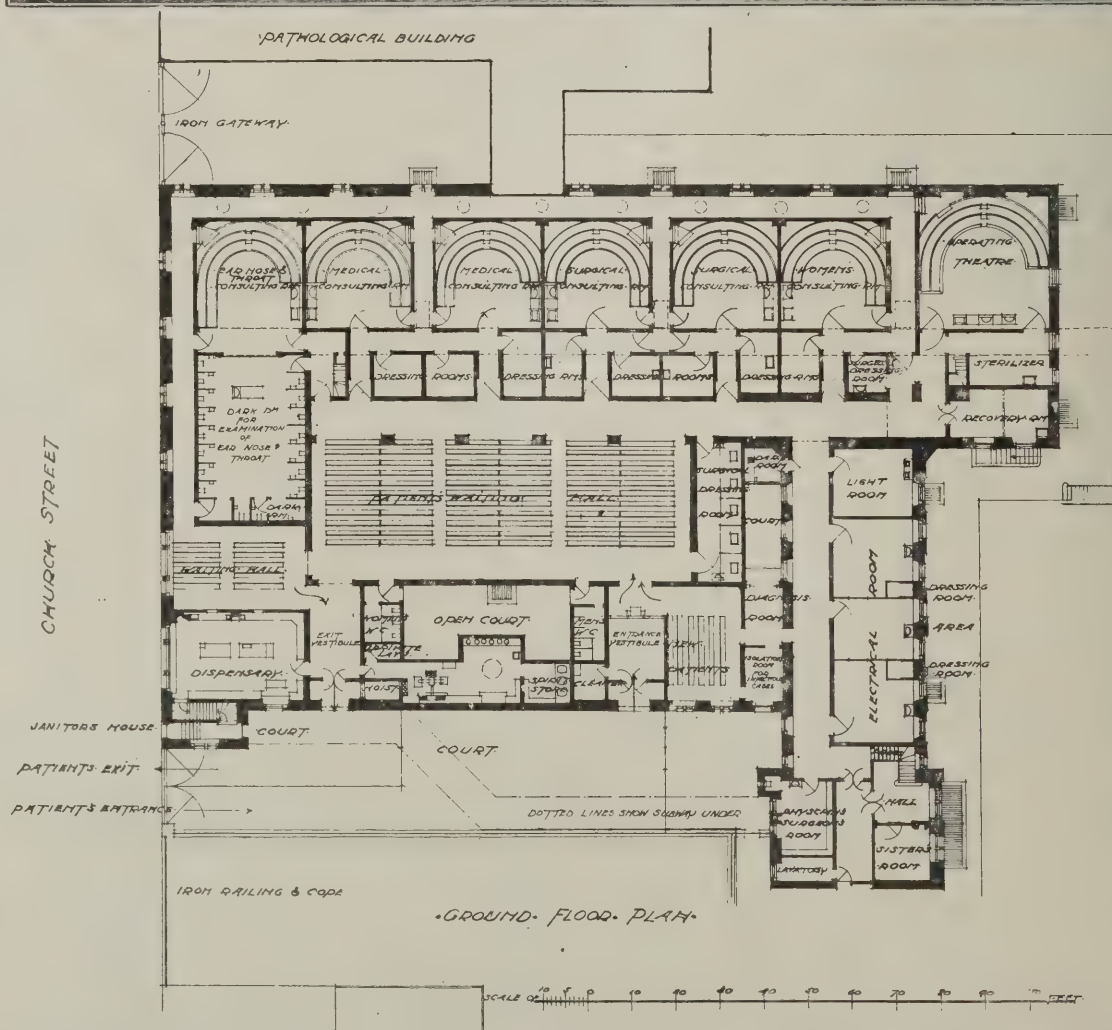
So far as the cost of motive power for lifts is concerned, electricity has a great advantage under present conditions, and this advantage will be still greater when current is supplied (as it will be next year in a great part of London) at a cost of only 1d. per unit. (Page 359.)

For the fourth time the Midland Plastering Co., Ltd., formed six years ago by the principal Nottingham contractors, declares a dividend of 10 per cent. per annum. (Page 360.)

Mr. Jackson's Little Scare.

THE collapse of the Charing Cross Station roof gave occasion to Mr. T. G. Jackson, R.A., to write to the "Times" last week on the subject of iron and steel in modern buildings. His remarks were quite of the nature of a scare. Doubtless some persons will think them timely, but for our part we do not favour the presentation of a very one-sided view with a show of authority, and least of all in the public press in connection with a disaster such as that which happened at Charing Cross, when blame is only too readily assigned to engineers and others who have to take responsibility. Mr. Jackson says: "The constitution of iron, robust enough in most respects, is delicate in others. Damp, which will not injure brick or stone, and will only destroy slowly the harder kinds of timber, will bring iron to speedy ruin. The life of an iron structure exposed to the weather depends absolutely and solely on the thin skin of paint we put upon it, which is constantly perishing and must be constantly renewed. Thirty years, one has heard it said, is the lifetime of a girder. There are, however, many parts of ironwork when once it is put together which a paint-brush will not reach, but to which water will penetrate, rusting the metal, eating into the joints and loosening the rivets. And ironwork is so bound together, and every part depends so much on its attachment to another, the whole structure consisting of a system of ties and braces mutually straining and strained by one another, that a fracture of one member may upset the whole construction. . . . Iron construction, it may safely be maintained, is still on its trial. . . . But the danger is not confined to great railway structures. It must be remembered that the house-fronts of miles and miles of London streets are entirely carried on iron girders, and that these girders are inaccessible, and can never be repainted, and that the name-boards and other facings that conceal them are not designed to be proof against the damps and fogs of London, to the ravages of which the iron girder is as susceptible as the human lung. . . . It is reported that an engineer has prophesied that no one will use iron or steel in his building thirty years hence. I feel sure that no architect who wishes his building to live should do so now. He will do wisely to exclude it from his work, except in such minor matters as ties and bolts and plates to stiffen timbers or small girders to carry floors. So used, iron is a valuable servant, but it makes a very bad

master." Such wholesale condemnation of materials which have been found to be of inestimable service, simply because they have a tendency to decay, is absurd. All materials are subject to the same tendency, and we have only to take proper precautions in order to delay or prevent that decay. Of course iron and steel require attention, but the same might be said of every detail of construction. There is no material which is permanent, and the only question to be considered is whether a material will have an efficient life long enough to justify our using it. For commercial building to-day iron and steel are very necessary. They also allow large light spans to be constructed which would be impossible with other materials. It is useless to rail against the utilitarian structure *per se*, because utility is the first essential of architecture, as of every art. Buildings have not to serve an idealistic purpose alone, but must have practical and commercial uses, and iron and steel are necessary to progress. In monumental buildings it may be reasonably doubted whether primary dependence should be placed upon unprotected iron and steel, although if proper precautions are taken they could be made to outlive timber, and would probably last as long as brick and stone, but architects who have to deal with this class of work must not expect to lay down the law for the greater number of structures. Buildings are not always required to last for ever. It is not as if there were no preservative processes which would prevent the corrosion of iron and steel. There are the Bower-Barff process, the well-known Dr. Angus Smith's solution, many anti-rust paints, and finally the encasing in cement-concrete—the best safeguard of all, and one substantiated by scores of instances. In reinforced concrete it has been conclusively proved that steel is completely protected against corrosion. To talk of iron construction being still on its trial is fatuous, and it is a little too conservative to ask us to refrain from the general adoption of new methods till they have been tested for a hundred years or more. Other architects have followed Mr. Jackson by calling the engineers of Charing Cross to account, but in doing so they have only betrayed their ignorance of the subject. Many theories about the disaster are suggested, most of which are quite unscientific, and we desire in the interest of the architectural profession to point out that these critics represent only a small and insignificant section of opinion.



This dispensary forms part of a scheme for the extension of the infirmary to the west. The building was completed in the early part of this year. It has been planned with the greatest care and is a model of its kind. The arrangement for the entrance and exit of patients is excellent.

NEW DISPENSARY AT THE GLASGOW WESTERN INFIRMARY. JOHN BURNET AND SON, ARCHITECTS.

FACTORY BUILDINGS.*

Their Planning and Construction.

By A. ALBAN H. SCOTT, F.I.S.E., M.S.A.

AS a preface to this subject of planning and constructing factory buildings I may note, in regard to the time occupied in building, that a workshop recently erected at Pittsburg, U.S.A., 1,220ft. long by 66ft. wide, was commenced and finished complete, with floors and electric travelling cranes, in the short period of nine months after commencement; and quite recently a factory requiring 1,500 tons of steelwork was commenced and erected in fifty days. This rather tends to show that our British steel constructing firms require to use more energy than they do at the present time in getting quick delivery and erection of buildings. Quite recently we were able to get a large shop, covering an area of about 30,000 sq. ft., fitted with heavy electric elevator cranes, finished complete in thirteen weeks.

American and British Workshops.

Comparison is often made between American and British workshops. It is unquestionable that the American workshops are the better planned, lighted, ventilated and more up-to-date generally. It might reasonably be assumed that this arises from the fact that most American workshops have been built in recent years, and have benefited by the experience gained in the older shops in England. Taking the modern shops in England, however, I think that they compare very favourably with the American workshops, and are far superior to the majority of Continental factories.

In designing a Factory

there is something more to be considered than the four walls and roof. In the factories of England there is a very extraordinary want of uniformity in design, and difference in the materials of construction. Every inducement should be given to the hands employed to suggest improvements in the works, machinery, &c., and it is usual in good English and American factories to provide a box specially to receive written suggestions from the employees, for which they are suitably rewarded. This, however is rather a question for management, which is not within the scope of this paper. I should like to add that it is most desirable that an annual inspection should be made of the whole of the buildings, and a report submitted to the owners, exactly as an auditor does each year with his accounts. The small fee chargeable for this would be more than repaid by the improved condition of the buildings.

Effect of By-laws.

We hear a great deal about the objections to the unnecessary restrictions contained in the by-laws of the urban and rural district councils. There are undoubtedly many points which require a considerable amount of modification, and thus allow a freer hand to architects and owners with regard to new factory buildings; at the same time, we have always found the district council surveyors very willing to help matters.

The Working Drawings

for this class of building, more especially for steelwork, should be profuse in details and notes. The use and abuse of colouring should receive careful consideration. Unnecessary colouring involves a waste of time and money, and is confusing.

Drawings should be prepared so that they can be sent to the contractor and worked to entirely without further explanation, and nothing in the way of constructional details should be left to the tender mercies of the contractor or the elastic conscience of his foreman. This system will save serious delays

in the output of steelwork from the contractors' works.

Dimensions should be carefully and fully figured on the drawings. No reliance should ever be placed on the scale. The present-day system of first tracing the drawings and then having sun prints taken from the tracings must necessarily result in a great difference between the scale of the original drawing and the scale shown on the sun print, by reason of unequal shrinkage, and this may result in great variations in the sizes of the parts which go to make up the building. Cutting to steelwork on the site is an expensive item, and a mistake of a few inches in the drawing will entail a vast amount of cutting.

Cost.

It is difficult to give any definite figures of the cost of factory buildings, as very little variation in the design of the building governs this to a great extent. However, it might be of interest to you to have the following particulars:—

First Building.—Constructed of steel, with screen walls of brick and with concrete foundations and asphalt flooring; ground floor and wooden upper floors having a floor space of 12,800ft. super.; height of building 11ft. clear for each storey; cost 1 $\frac{1}{2}$ d. per ft. cube.

Second Building.—Shop one storey in height, covering an area of 20,000ft. super., formed of steel and brickwork, taking very heavy electric cranes; height 22ft. to eaves, including all gantry rails and fittings, foundations, &c., paved with P.C.C. paving, 2 $\frac{1}{2}$ d. per ft. cube.

Third Building.—Covering an area of 10,560ft. super., height 18ft. to eaves, including reinforced concrete foundations and concrete floor, 1 $\frac{1}{2}$ in. paving, all complete, 1 $\frac{3}{4}$ d. per ft. cube.

A factory consisting of the ordinary solid brick walls with P.C.C. and 1 $\frac{1}{2}$ in. paving, steel principals, and slate roof, cost 4 $\frac{1}{4}$ d. per ft. cube.

Choice of Site.

In selecting a site for the purpose of factory premises there are many points to be kept in mind. Due consideration should be given to the fact that the site may have to be used for other purposes than those immediately under consideration. For instance, the site may prove to be too small after a fair number of years without any possibility of extension, in which case the whole works may have to be sold and a larger site bought, and it should then be possible to sell at a reasonable profit.

Generally, for all classes of manufacture, the site should be free from any risk of flooding by river, sea or other contingencies of a like nature, and a damp site should be avoided not only for the health of the occupants but also for the bad effect on the electrical plant, machinery and boilers. Care should be taken that river or sea walls are sufficiently strong and high to allow for excessive spring tides. Walls which are quite capable of retaining ordinary tides are far from sufficient to retain the heavier flood tides, and great damage will result through swamping of the site.

It is important to remember in purchasing a site that in almost all classes of factories

Heavy Machine Beds

must be put in, and in many cases part of the actual machinery has to be sunk below the floor-level, and this, when the permanent water-line is only a little below the surface, necessitates the floor of the factory being raised to a considerable height. Thus practically the whole of the site has to be raised so as to keep it clear of the water-line, and in order to have a free run into the various workshops the roads on the site need to be raised correspondingly. The great expense entailed by these works should therefore be fully considered before purchasing a site

only a little above the permanent water-line, or one liable to be periodically flooded.

Due regard must be had, to the possibility of cheap labour in the neighbourhood, and the accommodation close at hand for the employees.

Determining Nature of Foundations.

In considering the cost of any building land care should be taken to ascertain by trial holes or otherwise the probable nature of the foundations that may be required; and if a large amount of money will have to be spent upon them, owing to the expensive nature of the foundations, the cost of the site should be proportionately less.

If the site is of a wet or marshy nature, sometimes a danger arises owing to the water being drained off by local operations, such as the sinking of wells. This will cause subsidence over the general site, and also, in case the subsoil has a good vein of sand, it is probable that one of the adjoining neighbours will excavate for the sand, and might dredge below the water-line. This would again cause subsidence. Unfortunately, there is very little chance of getting compensation for damage done to buildings through this, and no compensation can be obtained when the damage is caused through water being drained from the site, although serious damage and danger may be caused to the adjoining buildings.

The site chosen should have some good means of transport easily available, such as a railway siding or a wharf, and it has been proved that a factory cannot economically be a half-way house between the locality where the raw material is purchased and the place where the finished goods are sold. Unless governed by other considerations the factory should be either as near as possible to the source of the raw materials, or else as near as possible to the customers.

Another point of importance is the provision of proper access to the site. It sometimes happens that the roads leading to the works are in such a bad condition, or are so narrow, with such restricted corners, it would be quite impossible to get a 30ft. boiler into the works.

Lighting.

Care should be taken that the building can be so arranged that light will be obtainable in the required direction. In some workshops and factories it is essential that the light should only be obtained from the north; in others, such as drying rooms, &c., a south light is more desirable.

The question of probable nuisance from the factory chimney should receive consideration. If a noxious trade is to be carried on, a licence will be required from the local authority. In a valley a chimney may have to be built to a great height to carry the smoke over the top of a village, thus causing a large additional expense.

General Lay-out.

In laying out the general plan of buildings, with a little manipulation small portions of the site can readily be made suitable for the purpose of planting low shrubs or trees, or even to form small gardens. This not only adds to the beauty and cheerfulness of the factory, where the employees spend at least one-third of their lives, but with the additional cheerfulness more work is attained in the same number of hours. The expense is not a serious item either for the first cost or for maintenance.

In forming the roads in the works I think the best form is to have the centre of the road the lowest point, so that all rain is taken away from the foundations of the buildings. Under the roads a series of small tunnels should be constructed for the accommodation of all pipes, &c., properly divided so as to reduce fire risks, &c., to the smallest degree; the whole of the covering to the tunnels to be made removable, and framed

* Abstracts from a paper read before the Institute of Sanitary Engineers on December 6th, 1905.

of material similar to the paving adopted for the road; these can be made very light, and to carry any weight, by using concrete slabs reinforced with steel.

The roads should be paved for at least a width of 16ft., and provision should be made for tramway tracks, which are of various gauges, from 15ins. to 30ins. The roadway should not be more than about 6ins. to 9ins. below the factory floors, as the tramways must have an easy run into the factory. It is not generally necessary to construct footways in works' roads, the traffic being comparatively so small as to render this additional expense unnecessary.

If it has been decided to adopt north lighting, this considerably affects the general disposition of the buildings. The main offices should be placed near the entrance, with the main gateways one each side of the office block, one being for the "in" road and the other for the "out" road. A small office for checking should be placed next the gates, and roadways should have weighbridges for carts. The gates should be opened and shut by levers from the check office. The works manager's and staff offices should be placed as nearly as possible in the centre of the works, with windows facing as much as possible towards the works.

Points to be noted in regard to Foundations.

The following points should be noted in regard to the treatment of foundation works in various soils:—Where a sand or gravel foundation overlies clay on a slope, a drain should be laid so as to intercept the water on the upper side of the building, and the ground should be built upon with as little excavation as possible. In the case of soft ground overlying hard, it is economical to sink to the firm ground if it is not more than 2ft. down. To escape the effects of heat and frost the foundations should be at least 3ft. under ground, and in clay soil at least 6ft. Rock forms a good foundation, but must be levelled, which is a costly operation. If on a slope, it should be levelled in steps and the hollows in the rock filled in with concrete. Gravel forms the best foundation. Sand should be laterally confined, to prevent it being washed away. Clay is treacherous and damp, and foundations should be taken deep down. A chalk soil should be kept well drained, otherwise it will be unfit for building on. Made-ground should be avoided where possible, even though it may have lain undisturbed for years. Where it is necessary to build direct on to made-ground a reinforced concrete raft should be employed to spread the weight over the whole site. In the case of soft ground overlying hard at a considerable depth below, piling may have to be resorted to. Piles may be of timber, reinforced concrete or iron screw piles. Another method is to sink brick or iron cylinders to the firm ground and fill in afterwards with concrete.

The machinery to be installed and method of working the different manufacturing processes should all be very carefully laid out before the buildings are designed, as well as the method of internal transit of raw and manufactured materials. The chief point to be kept in view is to so plan the buildings that a maximum output of work is obtained at the most economical rate.

The size and weight of the materials to be manufactured, also the sizes of the various machines required, must be carefully borne in mind, and the height, width and stability of the shops and spacing of the supports must be arranged accordingly. The stanchions and girders should be constructed to support the travelling cranes, jib cranes, shafting and other equipments, thus avoiding the necessity of introducing additional supports and framing to carry these after the main structure has been completed.

Heights and Spans.

No shop should be less than 20ft. in height; 12ft. is better. It is economical to keep the spans under 60ft. and not less than 20ft.

Taking a building 150ft. long by 120ft. wide, it is cheaper by £130 for a two-span building in comparison with a three-span covering the same area. It requires careful consideration whether a process of manufacture can be more economically worked in a building consisting of ground floor only or in one having several storeys. A flat roof is often a great convenience, and can be put to use in many ways; it is, however, likely to become a store place for rubbish. Projections on the interior and exterior walls should be avoided. The stanchion bases should always be kept clear of the floor-space.

Each shop or department should be fitted with a small office for the foreman, this being raised about 2ft. above the general floor, and glass placed all round. This office should be placed so that an uninterrupted view can be obtained over all the shop.

Emergency Exits and Outside Stairs.

Due consideration must be given to the exits necessary in case of fire. Additional doors, therefore, will probably be required, and in the case of buildings of more than one storey access to the roof should be made from at least two points of the building with fireproof staircases, and also external means of escape from the roof to the ground. This can be done by steel staircases, one at each end of the building; and these should not be fixed across windows, as is often done, thus running the risk of having these external staircases rendered useless.

It is advisable to have the large shops divided by partitions; these can be of light construction, and not necessarily absolutely fireproof, but sufficient to keep the fire back for at least half an hour or so.

Lifts.

It is better, if possible, to arrange the lifts outside the main building. Lift shafts are always a danger in case of fire, acting as a flue for the conveyance of smoke and flame, and in all cases they should be entirely enclosed with fire-resisting materials; the gates should be of solid 2in. teak or oak without panels. Internal staircases for the use of the workpeople should be provided, with special reference to the use of same in case of fire. The enclosures of these staircases should be treated similarly to the lifts; there should be no winders. The widths of the landings and staircases are controlled by the number of people that might be called upon to use these. The treads should be 10ins. wide and risers not greater than 7½ins. Doors to open outwards and provided with springs so as to give direct access to the open air.

Every building must have a secondary staircase, and a certain number of the windows should have openings sufficiently large to allow a person to get out. The treads of stairs should have the edges formed of movable slips, so that they can readily be repaired. The handrails should be of 1½in. gas barrel, with flush joints and easy ramps, fixed at least 1½ins. clear of walls.

Insurance and Fire-resisting Construction.

In planning the buildings due consideration should be given to the question of insurance rates for the buildings and contents. In some of the dangerous trades a large amount in premiums can be saved by judiciously spending a small sum of extra money in using fire-resisting materials where the factory adjoins another building; even a small parapet between two buildings sometimes reduces the premium rate by 15 per cent. There are cases where insurance companies will ask you to spend an enormous

amount of extra money, and if you are not careful to arrange premiums before the work is executed they absolutely refuse to allow any rebate on the rates.

Covered ways connecting the various buildings are objectionable, owing to the increased risk of spread of fire; they should, if required, be constructed of incombustible materials, and so arranged that they do not act as a flue.

Steel Construction.

There are many points in favour of steel construction. First, the practicability of constructing the whole of the building with it; secondly, the small amount of space taken up by the points of support; thirdly, lightness of the building, and the small cost of annual maintenance, there being only a small area of painting every three years. I should advocate that external steelwork be painted at least every two years.

The floor plan of factories should be rectangular; no odd corners or recesses should be allowed unless properly seen from the foreman's office. Recesses are not only bad for the shop itself but they destroy the uniformity of the building line in the works' roads. A few extra feet in height will make very little additional cost in a factory built principally with steel, and the introduction of a large area of flooring in the form of galleries round the building can be achieved at a small additional cost. In this case lifts should be introduced for the conveyance of goods. The gallery floor can be cantilevered out with fire-resisting floor.

The objection to steelwork is that it is rapidly destroyed in case of fire, unless the whole of it is surrounded by expanded metal lathing and plaster at least 1½ins. thick, and this has very rarely proved successful in a conflagration of any size. If left exposed, the effect of fire and water on the steel is to twist the beams and columns into extraordinary shapes.

The steel generally used for this class of work is that known as mild steel, with a minimum tensile strength of 27 tons per sq. in. and a maximum of 31 tons. The elongation should be 20 per cent. in a length of 8ins. The steel for rivets should comply with the Admiralty test. Steel and iron work is capable of beautiful treatment. In Belgium and France this is carried to a high point of art. The work is not hidden by false facings, but the rivets and bolts are formed into ornaments and the flanges and webs nicely panelled.

Boiler-house.

In considering the question of a damp-proof course under boilers, consideration should be given to the fact that a great heat is contained in the lower chambers. Personally I object to the slate damp-proof course, but a material should be selected that will not soften too much or melt at the temperature to which it would be subjected.

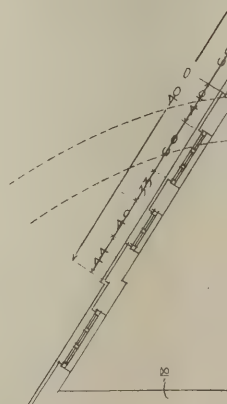
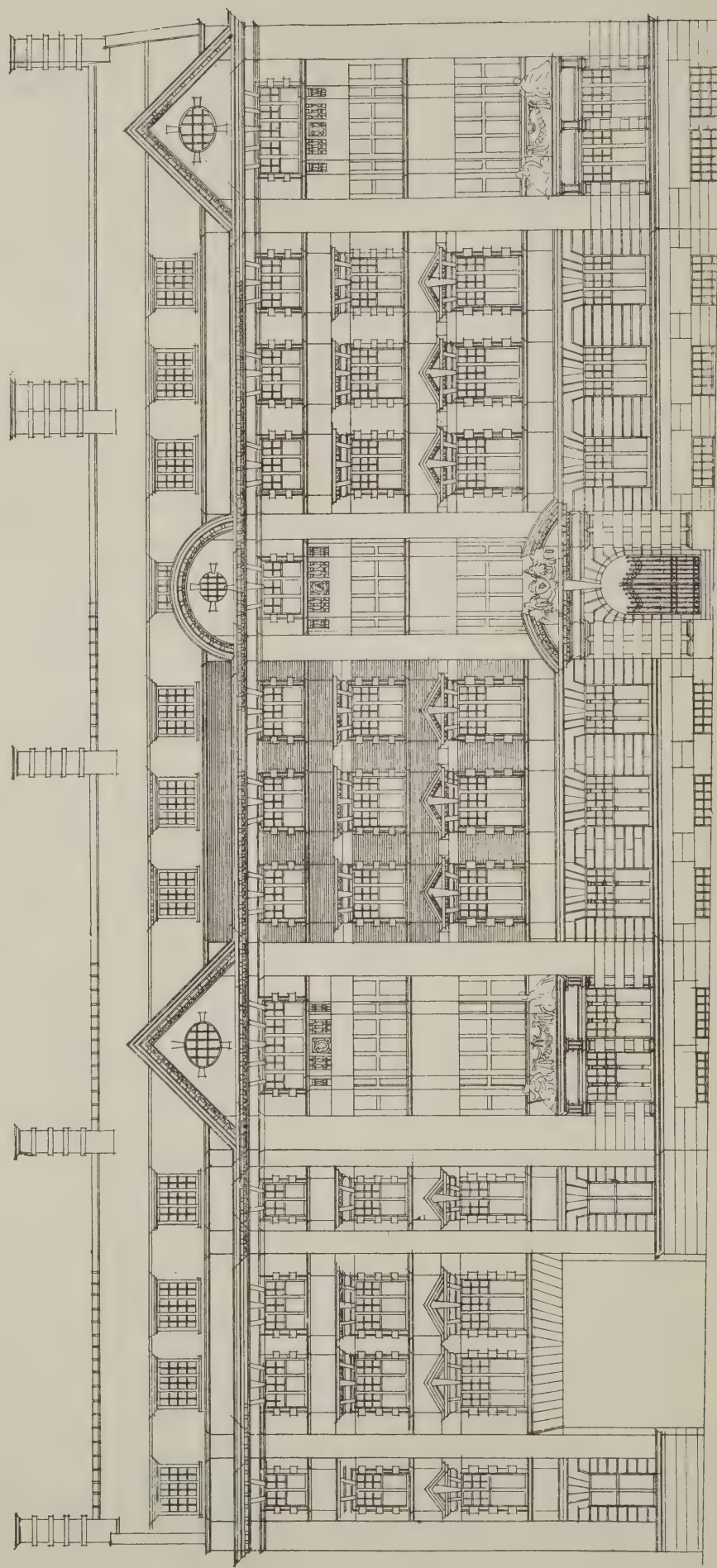
In planning the boiler-house the principal point to be kept in mind is the amount of coal to be stored and the best arrangement for unloading coal from boats or railway trucks by conveyor or otherwise. Generally speaking, a conveyor does not pay unless at least 6,000 tons are used during the year.

The front of the boiler setting should always be faced with glazed bricks, and if expense is not a large consideration the lower 6ft. of all the walls of the house should also be faced with this material.

(To be concluded.)

Another Fragment of the old London wall, 20ft. in length and 7ft. high, has been disclosed in the course of erecting a factory in Jewry Street, Aldgate. The owner of the factory is aware of the antiquarian interest in the relic, and has arranged for it to be kept in position, so that it will now project about 3ft. into one of the rooms on the lower ground floor of the new factory.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

OUR PLATES.

THE new tramway offices at Liverpool are now in course of erection on the east side of Hatton Garden, in the centre of the city. The frontage to Hatton Garden is about 184ft. The building will be six storeys high, consisting of basement, ground, first, second, third and fourth floors. In the basement are the overhead-line workshops and stores, strong-rooms, clothing store, eating chamber, &c. On the ground floor is the traffic department, with general and private offices, &c., and also a large car-shed. In the first floor are the general manager's offices, and on the second floor offices for the female staff. On the third floor are tailors' workshop, clothing store, dining-room for staff, kitchen, &c., and the caretaker's rooms. The fourth floor, which is an attic storey lighted by dormers and skylights, is to be used for store-rooms. Electric lifts will give access to the various floors, there being one passenger lift close to the main staircase, one goods lift from the basement to the car-shed level, and one goods lift at the back of the building for all floors. The larger rooms and corridors will be heated by low-pressure hot water, and the extraction will be by means of electric fans. Sanitary accommodation is provided on each floor for the use of the staff. The main staircase and corridors on the ground, first, second and third floors will have glazed-tile dados, and the floors of all corridors (except basement) will have terrazzo paving. All the light areas and strong-rooms and basement corridors are to

be lined with glazed bricks. The joiners' work for the ground floor is to be of teak and on the first floor of mahogany; on other floors, yellow pine and American whitewood. The main front to Hatton Garden will be built of Hall Dale stone and red Ruabon bricks, and the roofs will be covered with Welsh blue slates. The elevation to Johnson Street is to be of red pressed bricks up to the level of the first-floor sills, and Aston Hall brick facings with red pressed brick bands for the remainder. The sills and cornice, and other features not mentioned above, will be of local red stone. The work is being carried out by Messrs. W. Thornton & Sons, contractors, of Liverpool, from designs prepared by Mr. Thomas Shelmerdine, the corporation architect and surveyor. The cost of the buildings, exclusive of fittings and furniture, will be £48,650.

American Building Methods.—Mr. Charles H. Heathcote read a paper on American methods of erecting buildings before last week's meeting of the Manchester Society of Architects. This paper appears to have been the same as he read before the Society of Arts, reported in our issues for December 9th and 16th, 1903.

School Board Architects' Fees.—For preparing plans, &c., of all new schools for the Dundee School Board, and of additions or alterations to old schools exceeding in value £500, Mr. James H. Langlands's commission is to be 2½ per cent. and 3½ per cent. respectively. The measurer's commission is to be 1 per cent. on the total cost.

Law Cases.

A Paint Case.—In the Chancery Division of the High Court of Justice last week Mr. Justice Warrington heard an action brought by J. B. Orr & Co., Ltd., of the Silicate Paint Co., against Robert Smith, a painter and decorator, of Bury. The plaintiffs, as owners of the waterproof paint called "Duresco," alleged that the defendant had been passing off an inferior non-waterproof paint called "Freshel" for it, in connection with the re-painting of the technical schools and the textile operatives' hall at Bury. The defendant denied such statement, and said he had permission to substitute "Freshel" for "Duresco." After hearing all the evidence, his Lordship held that the plaintiffs had no cause of action, and he therefore gave judgment for the defendant, with costs.

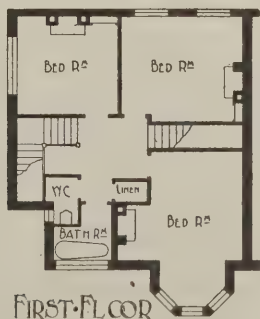
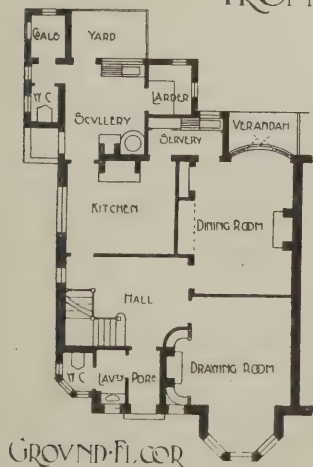
Architects' Fees.—In the City of London Court recently Mr. G. H. Paine, architect and surveyor, Moorgate Street, sued Mr. E. Lowitz, of Stoke Newington, to recover £21 5s. for the preparation of plans for a proposed villa. Mr. Paine stated that he had received instructions to prepare the plans at an agreed fee of 5 per cent. At a later interview he was instructed to finish the plans without waiting for the completion of the purchase of the site. The cost of the site and land was not to exceed £1,200. A month or two later the defendant said his wife would not sign the contract. Consequently the transaction fell through. The present claim was for 2½ per cent. on the estimated cost of the building. The defence was that before the complete plans were prepared the plaintiff was told that it was not defendant's intention to proceed with the matter. The jury returned a verdict for the plaintiff for £18 18s.

THE ARCHITECTURAL PLANNING OF PUBLIC BUILDINGS.

BEFORE last Thursday's meeting of the Leeds and Yorkshire Architectural Society Mr. H. W. Wills read a paper on this subject. Greek architecture, he said, though perfect in its limited field, had provided few lessons in planning, while, on the other hand, in some Egyptian temples they found conceptions not surpassed in their mystery and grandeur by any mediæval cathedral. But it was Roman work—its basilicas, baths, theatres, amphitheatres and palaces—which showed most clearly how far a magnificent and poetical conception might obliterate their sense of dissatisfaction at indifferent and coarse architectural detail. None of the mediæval churches were so fruitful in suggestions for modern use as were the Basilican and Byzantine types of planning. Wren's ability as a planner could be best judged by his smaller churches, and it was difficult to imagine why Wren's interiors had not been taken as models for dissenting chapels, in place of the hideous nightmares often afforded by such chapels, especially in Wales. Italian palaces afforded valuable lessons in planning, and the courtyard principle might well be adopted in many modern buildings. Some of the most valuable lessons in stately planning were found in the works of English architects, from the time of Wren and Inigo Jones to that of Sir William Chambers. Curiously enough, it was in designs of a domestic nature that they frequently found most fertile suggestions for public buildings. Greenwich Hospital he instanced as one of the finest groups of buildings in this country. There had been a great advance in the planning of libraries, especially in some of the recent American designs. In dealing with small schemes for public buildings they should refrain from using all the site, and adopt instead a concentrated group of buildings.



FRONT ELEVATION



GROUND-FLOOR

FIRST-FLOOR



SEMI-DETACHED HOUSES AT WIMBLEDON. CHAMBERS AND MARTIN, ARCHITECTS. These houses are about to be erected at an estimated cost of £1,650.

Enquiries Answered.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional or legal matters.

Correspondents are particularly requested to be as brief as possible.

The querist's name and address must always be given, not necessarily for publication.

Questions should in all cases be addressed to the Editor and be written on one side of the paper only.

New Bridge on Site of Old Pile Bridge.

CREWE. — HAMMERLESS writes: "The accompanying drawing shows a bridge I propose to erect on the site of an old pile bridge. The lines of piles shown are the piles of the old bridge. I propose to draw those which come within the area of the foundations in order to prevent uneven settlement. After these piles are drawn, would it be advisable and possible to fill the holes with sand? I do not know to what depth they are driven. Do you consider what I show is the best form of foundation in the circumstances? I am afraid that the abutment walls might be liable to uneven settlement: do you think there is any fear of

back, the latter being finished above the top of the existing chimney-pots; and since the new houses have been erected, and not before, A's tenant complains that with the wind in a certain direction he is smoked out. Should not A raise his chimney-stack to a suitable height? Is B liable in any way?"

If A's house has been built twenty years I am of opinion that he can prevent B from rendering his house smoky (2 & 3 Will. 4, c. 71), but if the house is not so old I have some doubt about the matter. In any case I doubt whether it is not better to suffer the inconvenience than to fight an action at law.

F. S. I.

Additions to Workshop.

E. H. writes: "My client wished to make an addition of one storey to his workshop, which is at present only one storey high. Plans were submitted to the local authority and passed. After this, however, my client resolved to add an attic also, which increased the height of the addition by 5ft. 6ins. Plans were not submitted for this little extra addition, which was thought unnecessary, and in consequence building was stopped by the council's surveyor. I therefore submitted a revised plan showing the whole addition, which is entirely in accordance with the local by-laws, but in spite of this the plans were disapproved, and the only reason given

such as will command the issue of a "mandamus" to compel the council to pass the plans.

F. S. I.

Formula for Strength of Struts.

HIGH WYCOMBE.—F. B. H. writes: "Is this a correct formula for wrought-iron bar struts with distance pieces —

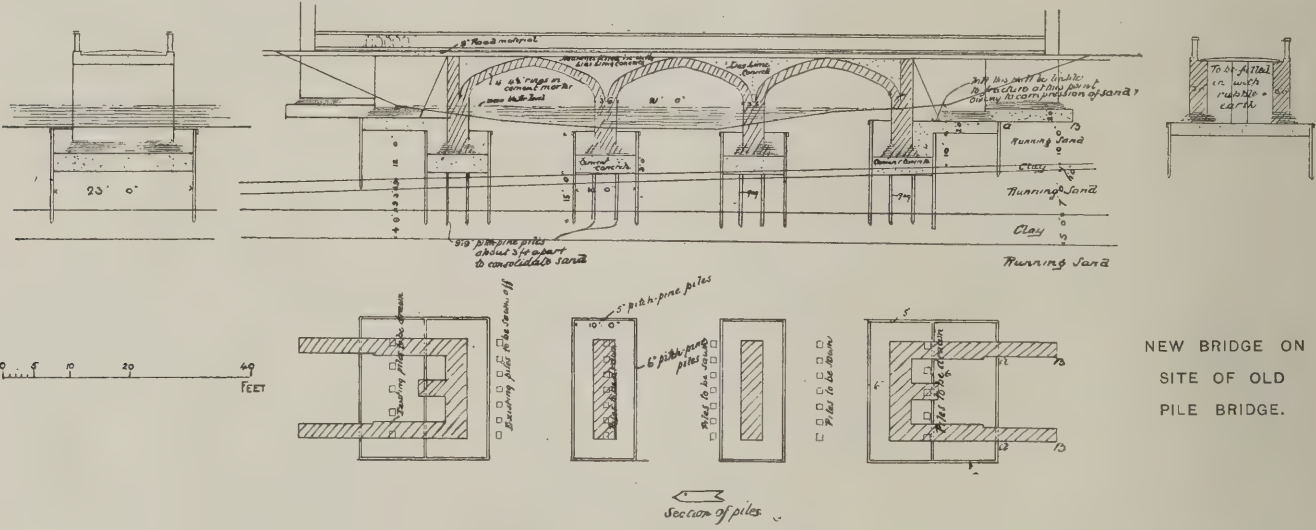
$$s \text{ (load per sq. in.)} = \frac{4}{1 + \frac{l^2}{750d^2}}$$

(for one end fixed), as it does not agree with the following table, which I take to be correct?—

Length, least width.	Safe loads in tons per sq. in.
60	$\frac{1}{2}$
50	1
40	$1\frac{1}{2}$
30	2
20	3
10	4

I suppose that the least width is the width of a bar, and *d* in the formula is the same."

The constants in Gordon's formula vary according to different authorities. Gordon himself only revived the formula (which was originally due to Tredgold) and gave no constants. An average constant for angle, tee, cross, channel, rolled joist, bars and distance pieces, hollow-square, and built sections generally, is $\frac{1}{900}$ for both ends fixed,



this? I propose to joint the piles as shown, so as to make the piling water-tight and then to pump out the water and excavate to the required depth. The bridge is across a river in a private park, and will not be subject to heavy loads. Would it be necessary to put in pile foundations under that part of abutment walls marked A B on the plan?"

If the present piles are chiefly through running sand, the sand will fill into the holes again as the piles are drawn, and therefore will require no other attention. The proposed arrangement for the new work looks very suitable to the case, except with regard to the end portion of the wing walls at each abutment where they project beyond the sheet piling. The concrete under these ends may be widened somewhat to reduce the intensity of pressure. There does not appear to be any particular liability to fracture at the foot of the bank, but the whole case is one of inevitable risk, owing to the alternate beds of running sand and clay.

HENRY ADAMS.

Smoke from Chimneys and Adjoining Premises.

TONBRIDGE writes: "A owns a house at the end of a terrace, adjoining which was a vacant piece of land upon which B has erected two houses to the same line of frontage, but these houses are carried up higher than A's. The chimney flues of the existing house and the new house are back to

is that the building is undesirable. I may say that the man who occupies the property adjoining that of my client (and who carries on business as a grocer and fancy dealer) wrote a letter to the authorities objecting to any addition to this workshop, and complained of an obstruction to his light, which is not ancient, and which in fact would be difficult to prove, and this letter, together with a little personal feeling over the matter, has without doubt influenced the decision of the authorities. What course should I adopt?"

The addition of the attic storey clearly justified the urban district council's surveyor's action in stopping the work, even though everything was being built in strict accordance with the by-laws. You submitted plans for a two-storey building and then proceeded to erect a three-storeyed one! That your council should now refuse to pass plans merely because they consider the building to be "undesirable" is, apart from the first issue, quite unjustifiable. They must either pass plans or refuse them on their merits, and not deal with them in accordance with some idea or "fad" of their own. If your client still wishes to complete his building to the full height of three storeys, I advise you to put the matter in the hands of a local solicitor at once, taking care to give him all the correspondence that has taken place from the beginning. He will then be able to advise as to whether or not your case is

$\frac{2\frac{1}{2}}{900}$ for one end fixed and the other pivoted, $\frac{4}{900}$ for both ends pivoted. The objection to this formula is that the strength does not vary so much in accordance with the diameter as with the radius of gyration, which was the modification introduced by Rankine. The table of safe loads given by querist is only approximate; it appears to be for wrought-iron struts fixed at both ends.

HENRY ADAMS.

The new Reredos in St. Michael's, Headingley, Leeds, was dedicated last Thursday. One of Pearson's most successful parish churches, St. Michael's has hitherto been conspicuously lacking in a focus, which the reredos, designed by Mr. Temple Moore, supplies. It consists of a series of niches filled with figures richly decorated, and surmounted by a cresting.

A Reredos in King's College Chapel, Cambridge, is proposed to be erected from designs by Mr. Detmar Blow and Mr. Fernand Billerey. The general idea of the scheme is to continue the Renaissance woodwork panels round the east end of the chapel, heightening their effect by more elaborate carving and by gilding. At the back of the altar between pairs of Corinthian columns are to be three statues.

R.I.B.A.

Messrs. Alexander Gascoyne and
A. J. Dix on Stained Glass.

A MEETING of the Royal Institute of British Architects was held on Monday evening at 9, Conduit Street, W., the president (Mr. John Belcher, A.R.A.) in the chair, when papers on "Stained Glass" were read by Messrs. Alexander Gascoyne and A. J. Dix.

The death of Mr. H. H. Collins, elected an Associate in 1859 and a Fellow in 1877, was announced.

Mr. Alexander Gascoyne, referring to examples that remain of old stained-glass work, said that, without attempting to copy deliberately, many lessons may be learnt from it. If once we can catch the spirit and feeling that inspired the early glaziers, and work it into modern requirements, we shall be progressing towards perfection. Whether or not glass can be manufactured equal to the old glass is a matter of opinion; but by waiting and picking out the choicest sheets at the makers', and carefully selecting these, results can be obtained which will compare favourably with the early windows. It is the inequalities, variations of thickness and colours, and accidental markings which give the depth and brilliancy to the glass, and upon their judicious employment depends the success of the work. In good work the cost of the glass rarely, if ever, enters into the consideration of the glazier; he chooses the various glass as the artist does his colours.

Beautiful Results

can be obtained by giving a free rendering of the early principles, and by designing foliage or ornament to take the place of canopies and bases, without losing the feeling or character of the old glass. It is immaterial what particular style is adopted provided we allow our originality to develop that style and produce stained glass which for charm of design and colour will adapt itself to the character of the building. The assistance architects can give in suggestions for the general schemes of windows cannot be over-estimated; their co-operation has produced in many instances most successful results. When the profession as a whole demand really good work, and encourage designers who are known to have the interests of their craft at heart, there will be no lack of beautiful work. But so long as the greatest demand is for the cheapest article it cannot be expected that the domestic or ecclesiastical stained glass of this country can improve. A stained-glass window

Need not necessarily be Expensive.

It can be made simple in design, and therefore not costly; but it does not follow that it is not in the best possible taste, and that the best material has not been used. The author impressed upon those designing stained glass for churches that the windows have a double mission—they should form a beautiful decoration and be devotional in feeling. The figures introduced should be an aid, not a hindrance, to devotion. Arouse the critical faculty, and no devotion is possible. To design some windows much careful consideration is necessary; really good work can hardly be done unless the artist is personally in sympathy with the object of the design. Stained glass for modern dwellings should be designed to form part of the decorative scheme; the building itself should be seen before preparing designs. Rich colour schemes should be used with the greatest care. Simple treatment in white glass has been used by some architects with most satisfactory results, harmonizing admirably with any style of decoration. The importance of massing the design in domestic ornamented glass cannot be over-estimated.

Referring to the full-size detail drawing prepared to give the architect an idea as to the general effect of the leads, the author pointed out that this was not a working drawing; a line drawing of the various shapes of the glass had to be prepared to guide the cutter in cutting the glass and the glazier in piecing it together; unless every care was taken with this drawing all the architect's trouble might be lost.

Mr. Dix's Paper.

Mr. A. J. Dix, after explaining the difference between stained and painted glass and defining the term "stained glass," said a design for a stained-glass window may be in any medium and upon whatever material that most commends itself to the artist. Nor is it even necessary that a design should be made at all. In the author's opinion the highly-finished competitive design for a stained-glass window is

A Mistake, a Delusion, a Snare.

An attractive design is by no means a guarantee of a good window. The capabilities of a maker of stained glass should be judged by his finished work and not by design. One very important point to observe is the architectural fitness of the design—*i.e.*, its suitability as regards proportion, not only as a whole but in detail. It should always be treated in such a way that will keep the window subservient to the architecture, about which there need be no fear if a strict adherence be observed to the natural limitation of the material. The position and size of window should be thoroughly considered, as much detail is often thrown away and a broadness of effect missed by over-elaborating a window which is only seen from a distance; also the amount of light one may safely exclude without over-darkening the interior of the building should be considered. The author went on to speak of the selection of the glass—perhaps the most interesting and absorbing stage in the work. The practice of superimposing pieces of glass held together in one lead in two or even three layers, called

Plating,

though occasionally a useful expedient, the author considered should not be resorted to until every resource had been exhausted to obtain the required colour or tone. As regards the best tint of white glass, one could not go wrong in choosing a tint so often found in early glass—*i.e.*, a cool greenish hue. Describing the method of preparing and arranging the glass before painting, the author emphasized the importance of viewing the glass so prepared in a position against the light, as it will be in the window when finished. Now is the time to make any alteration desired. If the corrections are not made now before the work is painted, any offending pieces will be more reluctantly discarded at a later period. The whole making of a stained-glass window should be one of elimination, adding to, and correction, not only in the initial stage of the glass in its state raw but as the work proceeds, altering the work to obtain the effect aimed at as it progresses. In the process of painting and in fact at no period should anything be taken for granted; the work should be viewed in a perpendicular position and from as great a distance in the studio as possible, and no advance made until at each and every stage nothing suggests itself that could possibly be improved upon. The author went on to describe the process of painting the glass, the pigments employed, the firing, leading, &c.

A vote of thanks to the authors of the papers was proposed by Mr. J. D. Crace and seconded by Mr. G. H. Fellowes Pryne. Messrs. G. Hubbard, C. Harrison Townsend, E. W. Hudson and Mr. John Belcher also spoke in the discussion.

NEW LONDON BUILDINGS.

AT last week's meeting of the London County Council the Building Act Committee reported the following application under the London Building Act, 1894, their consent or refusal being appended in *italics* :—

Extension of the period within which the erection of a bay-window at No. 3, Wedderburn Road, Hampstead, was required to be commenced, on the application of V. H. King, on behalf of F. E. F. Barham. (*Consent.*)

Buildings on the northern side of Codrington Hill, Brockley, on the application of J. W. Webb. (*Consent.*)

Addition at the rear of St. Paul's Presbyterian Church, West Ferry Road, Millwall, on the application of T. P. Figgis, on behalf of the committee of the church. (*Consent.*)

Enclosures to the sides of a porch at the Royal Horticultural Hall, Vincent Square, Westminster, on the application of E. J. Stubbs, on behalf of the Royal Horticultural Society. (*Consent.*)

Projecting carved wooden hood over the entrance to an addition to the hall of the Company of Tallow Chandlers, Cloak Lane, City, on the application of J. D. Mathews & Son, on behalf of the Company of Tallow Chandlers. (*Consent.*)

Retention of a shop front erected under the projecting landing at No. 150, Finchley Road, Hampstead, on the application of Saunders & Son, Ltd. (*Consent.*)

Retention of an iron and glass roof in front of Nos. 24 and 26, High Street, Peckham, on the application of G. F. Morgan & Co. (*Consent.*)

Two glass and iron shelters at the Aldwych Theatre, to abut upon Aldwych and Drury Lane, Strand, on the application of W. G. R. Sprague, on behalf of the Hicks Theatre Syndicate, Ltd. (*Consent.*)

Retention of an open glass roof in front of a greenhouse adjoining No. 79, Queen's Road, Peckham, abutting also upon Carlton Grove, on the application of A. Madgett. (*Refusal.*)

Studio at the rear of No. 70, Addison Road, Kensington, to abut upon Addison Crescent, on the application of A. Poynter, on behalf of Sir E. J. Poynter, Bart., P.R.A., (*Refusal.*)

Retention of two projecting signs at No. 17, Newman Street, Oxford Street, St. Marylebone, on the application of T. Stevens, on behalf of "Argyll's London, Limited." (*Refusal.*)

Five houses on a site abutting upon the north-western side of Church Lane and eastern side of Moring Road, Tooting, on the application of Nash and Lillywhite. (*Consent.*)

Buildings on the site of Nos. 1 to 6, Lombard Street and the Gresham Club, St. Swithin's Lane, City, with external walls at less than the prescribed distance from the centres of the roadways of St. Swithin's Lane and George Street, on the application of Dunn & Watson, on behalf of the Scottish Provident Institution Buildings, Ltd. (*Consent.*)

One-storey bay-window addition at the rear of No. 28, St. Petersburg Place, Paddington, with external walls and boundary fence at less than the prescribed distance from the centre of the roadway of St. Petersburg Mews, on the further application of T. H. Smith, on behalf of F. Lenders. (*Consent.*)

Retention of one-storey buildings on the north side of River Bank, Anchor and Hope Lane, Charlton, with external walls at less than the prescribed distance from the centre of the roadway of River Bank, on the application of J. Rowland, on behalf of Flower & Everett. (*Consent.*)

Retention for a further period of a boundary fence on the northern side of a footway leading from Bridge Avenue to Mail Road, Hammersmith, at less than the prescribed distance from the centre of the roadway of such street, on the application of E. J. Harbott on behalf of Coburn & Co. (*Refusal.*)

Buildings on the site of Nos. 321 and 323, Oxford Street, to abut also upon Dering Street, on the application of Gordon & Gunton, on behalf of Hitchings, Ltd. (*Refusal.*)

Buildings on a site on the northern side of Snowfields and the eastern side of Weston Street, Bermondsey, on the application of Rings & Myers, on behalf of E. B. Kapp. (*Consent.*)

New street for carriage traffic to lead from Merrow Street to Shaftesbury Street, Walworth, on the application of Chitons on behalf of the Ecclesiastical Commissioners. (*Consent.*)

Streets for carriage traffic out of the north side of Uxbridge Road, Hammersmith, eastward of St. Luke's Church, on the application of F. W. Tanning, on behalf of the Trustees of the McQueen Trust Estate. (*Refusal.*)

Modification of the provisions of Part V. of the London Building Act, 1894, so far as relates to the erection of Nos. 189 to 214 inclusive and Nos. 215 to 240 inclusive, Oakwood Court, Kensington, on the application of Rolfe & Mathews, on behalf of Jones Brothers. (*Consent.*)

Modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of residential flats to abut upon Seymour Street, Edgware Road, and Connaught Mews, Paddington, with irregular open spaces at the rear, on the application of D. Brown, on behalf of Lady E. R. Hope. (*Consent.*)

Means of escape in case of fire proposed to be provided on the seventh (top), sixth and fifth storeys and the fourth floor mezzanine of a building to be known as "Thorney Court," Kensington, on the application of Millard & Pryce. (*Consent.*)

WORM HOLES IN WOODWORK.

A Summary of Information as to Causes and Cures.

[A correspondent having put to us the question set out below, we submitted the enquiry to Mr. Harry Hems, of Exeter, whose long experience has enabled him to give an authoritative reply. This we here print in the form of an article, which is intended to meet all future enquiries, so that correspondents will not need to submit further queries on the subject.]

LEE.—F. G. R. writes: "What is the cause of (I imagine) a dry-rot in hardwoods, such as picture frames and furniture? The defect consists of a number of small holes, as if the wood had been eaten away. I shall be glad if you can also inform me of any preventative which can be applied to furniture, &c., to protect the wood from these defects. I have seen several cases in houses in Ireland where the furniture has been destroyed in this manner."

Various Remedies.

This is a condition of things that constantly brings queries, and all sorts of remedies have from time to time been suggested through the medium of various technical journals. It has been recommended to saturate the wood with turpentine, or with benzine and with equally good results perhaps. Further, a strong solution of corrosive sublimate, or an infusion of a bitter kind, such as quassia, has also been tried with a fair amount of success. Copperas and glue, or linseed oil, mixed with turpentine in equal proportions, may be rubbed in daily for a week or two. Such applications have been known to kill the worms. Another receipt is to apply a solution of vitriol, mixed with melted beeswax and a little plaster-of-Paris. A thin paste of this (whilst warm) should be applied to fill in the holes. That done, soak the rest of the wood with methylated spirits of wine and camphor or (if preferred) well saturate it with turpentine alone. Further, fumigate the worm-eaten stuff in an air-tight closet with benzoline. Good results have also been procured by boiling colo-quintida in a little water and dissolving some vitriol in it. This is an application in which some have much faith. Again, tallow may be rubbed into the holes and the furniture afterwards warmed (oil is said to be death to the worms); rub the tallow in several times, or use mercurial ointment in the same way. Take 5 parts of turpentine and 1 of phenol; with a brush well saturate the holes with this mixture so that the liquid has plenty of opportunity for flowing well down into the burrows. Afterwards the holes may be filled up with beeswax dissolved in turpentine, made into a thick paste. The phenol, if it is fortunate enough to reach them, will, of a surety, destroy all the larvae.

Of all these several popular receipts, the application of paraffin oil, or mercurial ointment, are the simplest preparations to use, and perhaps as effectual as any.

Dry-rot a Cause.

The correspondent's suggestion that dry-rot may possibly be the cause of the mischief complained of opens out a different view of things. The primary cause of dry-rot is want of sufficient ventilation, but this can scarcely apply to furniture.

For dry-rot a common remedy recommended is a wash of mercuric chloride (1 to 8 gallons of water), care being taken to thoroughly soak the wood with it on every side. But this must not be applied until after the material has first been thoroughly well cleaned. The application must be repeated frequently for twelve or eighteen months, when some who have tried it assert the disease will be thoroughly stamped out. A very full and useful paper upon this subject has recently been issued by the Board of Agriculture and Fisheries (No. 113) entitled "Dry-rot (*Merulius lacrymans* Fries)," and as this has probably failed to come under the eye of the correspondent in

question, it may be interesting to him as well as to others. This is what it says: "As a destroyer of timber used in the construction of dwelling-houses, the fungus popularly known as 'dry-rot' has been well known for many years. Notwithstanding modern improvements in ventilation, &c., the disease appears to be gradually gaining ground. This is chiefly owing to the following causes:—(1) The use of immature and imperfectly seasoned wood; (2) the rapidity with which modern houses are built, resulting in the imprisonment of a superabundance of moisture in the material used.

The Beginning of Dry-rot.

"Infection with the dry-rot fungus sometimes takes place in the forest, when felled timber remains stored there for some time. The first evidence of such infection is indicated by the presence of red stripes in the sawn wood. If such wood is thoroughly seasoned the mycelium present in the red stripes is killed. If the seasoning is neglected or imperfectly done, the mycelium, which possesses the power of remaining in a latent condition for some time, commences active growth when the wood is used in any part of a building where it is exposed to dampness, and this in some cases is unavoidable, as when the ends of joists are built into a wall. Under such circumstances, dry-rot eventually appears. On the other hand, the fungus is by no means rare on old beams and boards stored in wood yards, &c., and it is mainly from such sources that spores or portions of the spreading mycelium are introduced into buildings by new wood which has become infected. Again, when a house that has suffered from dry-rot is being repaired, sufficient care is not exercised in the immediate destruction, by burning of all diseased wood, and portions that are not too much decayed are often stored for repairing purposes. In consequence the air in towns always contains spores of the dry-rot fungus.

Precautions.

"During the building of a house, the danger arising from the presence of dry-rot may be reduced to a minimum by taking proper precautions. A thorough system of ventilation and the avoidance of damp, stuffy places is of primary importance. The endeavour to exclude dry-rot by hermetically closing all communications with the outer air in the spaces between flooring-boards and joists and similar places, has been practically demonstrated to be an utter failure. In the case of a recently-constructed mansion the expenditure of many thousands of pounds was entailed in rectifying the consequences of such a proceeding. Perhaps the greatest source of danger arises where the ends of joists are built into a wall near the basement of a house, and this is more especially true where there is evidence of red stripe in the wood. As a precaution, the ends of joists should always be treated with creosote.

"Coal tar is not recommended, as its power of penetrating into the wood is very limited, and by forming a waterproof coating it prevents the wood from drying. A frequent cause of trouble is the use of damp, deadening material, or pugging and covering it over with boards before all the moisture has evaporated. Such material should be used as dry as possible, coarse sand being the best for the purpose. The surface of boards coming in contact with deadening material should first be painted over with methylated spirit containing corrosive sublimate in solution 6 ozs. to 1 gallon. The spirit evaporates, leaving a coating of corrosive sublimate on the boards, which completely destroys any mycelium coming into contact with it. It has been proved that the spores of dry-rot can only germinate in moisture containing some alkali in solution, hence coal-dust, cinders or any kind of

humus should never be used for deadening or packing.

"The fruit of the dry-rot fungus presents the appearance of irregularly-shaped, flattened or undulating patches of variable size, adhering by their entire under-surface to the substance on which they are growing. When mature the central portion of the patch is covered with an irregular network (a) formed by slightly-raised anastomosing ribs, and is of a rich brown colour, due to the enormous quantity of spores, which are deposited on surrounding objects under the form of snuff-coloured powder. These spores are diffused by currents of air, or by rats, mice, insects, &c. The margin of the fruiting patch is surrounded by a snow-white fringe of mycelium (b) which spreads in every direction over surrounding objects, creeping up walls, and passing through crevices, the advancing mycelium (c) being supplied with food and moisture from the parent plant, growing on wood. This food is conducted through cord-like strands, which form behind the thin advancing margin of mycelium. Owing to this supply of food from a central source, the mycelium can extend over stones and other substances not containing food, and thus spread from the basement to the top of the house. Each time the migrating mycelium comes in contact with wood the latter is attacked, and a new centre of food supply is established, from which strands spread in search of other sources of food.

"The mycelium often forms felt-like sheets of large size, that can readily be removed intact. These sheets are white at first, but soon change to a pale-grey colour, a character by which dry-rot can be readily distinguished from another wood-destroying fungus, polyporus fermentations, even in the absence of fruit, the felted mycelium of the latter remaining permanently white.

How to Check Dry-rot.

"The spreading mycelium can be checked by the application of carbolic acid, and when its presence is once detected all wood-work that can be reached should be thoroughly saturated with the same substance. The specific name of *lacrymans*, or 'weeping,' alludes to the power of the fungus to attract moisture from the atmosphere. Under certain conditions, moisture is absorbed to such an extent that it hangs in drops, or even drips from the surface of the fungus. This moisture assists very materially in rotting the timber, which, afterwards becomes quite dry and friable. Hence the name 'dry-rot,' which alludes to the last and most frequently observed stage of decay." The above information will probably be useful to many readers.

HARRY HEMS.

Obituary.

Mr. W. Moss Settle, A.R.I.B.A., architect, of Barrow and Ulverston, died on Wednesday last. He was only 29. Having commenced practice for himself at Barrow, he was engaged as architect to the Walney Estates Co. In Barrow he was architect for a number of new buildings and shops.

Mr. H. H. Collins, F.R.I.B.A., F.S.I., of London, died on Wednesday last in his seventy-third year. He was the architect of numerous city offices and warehouses and also of many mansions—including Callis Court at Broadstairs. He was also the architect, selected in competition, for the new Lying-in Hospital for Women in City Road. Since 1877 Mr. Collins had acted as district surveyor for the eastern division of the City of London. He was an expert in arbitrations and light and air cases, and as such his services were in much request.

THE ARCHITECTURAL ASSOCIATION.

Mr. Bidlake on Towers and Spires.

A MEETING of the Architectural Association was held on Friday evening at 18, Tufton Street, Westminster, Mr. E. Guy Dawber, F.R.I.B.A., president, in the chair.

The following new members were elected: Messrs. E. E. C. Clayton, R. N. Hewitt, G. T. Jell, F. J. Daniel, S. Davies, W. G. Wales, and Sir F. C. Rupert Ford, Bart. Mr. R. Herbert was reinstated.

A paper on "Towers and Spires" was then read by Mr. W. H. Bidlake, of Birmingham.

In dealing with the subject Mr. Bidlake said he should not attempt to adduce any new facts or invent any new theories; indeed, it was difficult, unless one was content with minor examples, to find any illustrations which had not already been given in that excellent series of drawings in "Wicke's Towers and Spires," which, since its publication in 1855, had been regarded as the standard work on the subject.

Proceeding, Mr. Bidlake referred to the position of the tower—in a typically English church at the centre of the west end, or, as in the typical cathedral front, two towers flanking the central doorway; occasionally a still more magnificent façade being presented, either by extending the screen beyond the towers to flanking north and south turrets, as at Lincoln, or by placing the towers themselves outside the aisles, and decorating the extended front with splendid sculpture, as at Wells; or, grander still, the arcaded caverns of Peterborough.

At Exeter twin Norman towers form the transepts, while Ely is the only example of a cathedral with a western tower on the central axis, a position so common in the parish church.

Some of our cathedrals have no western towers now remaining, as Winchester: and poor indeed do their fronts appear in comparison with others mentioned.

The Central Tower.

The dome of the Byzantine and the lantern of Spain and the South of France becomes, in Normandy, the central tower, and no Norman or Anglo-Norman cathedral was complete without it. In France the loftiness of the high vault compelled her architects to substitute for the central tower the elegant, but far less imposing, timber *flèche*; and if, after contemplating the wonderful loftiness and airiness of her cathedrals, we return dissatisfied with the low proportions of our own, let us find consolation in the fact that this very lack of internal height has secured for us the retention of the central tower.

The typical Norman cathedral then had both central and western towers, as at Southwell, and it is only when all three are present that the English cathedral realizes its full majesty, and becomes, in fact, one of the grandest works of man.

Timber and Lead Spires.

It is possible that each tower was intended—after the Norman period—to carry its spire. Not a few had timber and lead spires at one time, which have since been taken down. Lincoln once had small timber spires on the western towers, as shown on old prints, and a spire no less than 523 ft. high on the central tower. It is possible, too, that Peterborough was intended to carry spires on all its five towers, but Lichfield alone of all the cathedrals retains her triple spires, and these endow her with such grace that she becomes one of the most beautiful and distinctive in the country.

Saxon Towers.

Of the Saxon towers still remaining many of them are in the centre of the west end, as at Earls Barton, and it seems not improbable that the western position of the tower

in subsequent styles was due to a discontinuation of this essentially English arrangement, a supposition rendered the more probable by the rarity of central-western towers in Normandy.

Towers on One Side.

Although the central-western position of the tower is the typical one for the parish church, it is occasionally found on one side, as at St. Mary Redcliffe, Bristol, or St. Martin's, Stamford. At Wisbeach the tower is almost detached from the church, and in the surrounding district may be found several instances in which it is wholly so. The magnificent tower of West Walton, some few miles away, forms, in fact, the lych-gate of the churchyard. Detached towers are also a local peculiarity of Herefordshire.

Octagonal Towers.

While in an overwhelming majority the tower plan is square, the octagon is occasionally found, as at Stanwick; and in Norfolk and Ireland the round tower is frequent; in the former due to the use of flint and the difficulty of building quoins in that material.

Both Saxon and Norman towers must have been roofed with wood, and a simple squat pyramid, like those which the late Mr. Christian reconstructed on the Norman west towers of Southwell, must have been very frequent, because their construction would be the simplest and most direct. But timber spires must also have existed, for they are represented in old manuscripts. Their form in all probability resembled the ancient timber spires still existing at East Meopham and Newhaven, which, though not of actual Norman date, probably reproduce the design of the Norman originals. This form of spire is octagonal in its upper portion, the diagonal sides bending out below towards the angles of the tower, which they meet in a point. Its shape is due to the timber angle-pieces of the spire being framed into a collar, which is supported by the hip-rafters of the lower spreading sides. This type of spire is common in Germany, as at Erfurt, and still more so in Scandinavia. A fine modern example is that of All Saints' Church, Margaret Street, by the late Mr. Butterfield.

Both this form of spire and the squat pyramidal roof were subsequently translated into stone, and the former may be found as late as the Perpendicular period, as at Bythorn.

We may also suppose that an octagonal timber spire arose sometimes from a flat tower roof, and gave rise to that form of spire so common in France, of which Christ Church, Oxford, is an example. This form, however, like the simple pyramid, was destined to die out; while

the Broach Spire.

which, if it did not originate in Northamptonshire, was certainly developed in that district, took its place in the Lancet period. The broach spire is, in the main, a copy in stone of a timber roof, and its cardinal sides come down over the sides of the tower and end in dripping eaves, but the broaches which fill the triangular spaces between the diagonal sides of the spire and the angles of the tower are of true stone construction, and whether their sloped sides meet those of the spire high up or low down, will determine very much the general outline and character of the spire.

At first these broach spires are of an obtuse angle, and have bold spire lights. One of the noblest spires of this type is to be found at Frampton, a small village near Boston, hidden in trees.

Towers of the Lancet Period.

In the towers of the Lancet period buttresses are sometimes employed in pairs at the angles—the diagonal buttress comes later—but they stop at the belfry stage against the flat pilasters which have been retained from the earlier style. The staircase turret

likewise stops short either of the belfry stage or the spire eaves, and a corbel table is carried between the angle pilasters so as to offer an unbroken square as seating for the spire.

Features in Development.

As the style advanced the broach spire became more acute and loftier, and the broaches and spire lights less in proportion. The broaches, moreover, began to take to themselves pinnacles either at the extreme angle of the tower or at their apex against the spire, or midway up the slope. Next, the bottom spire light was no longer placed on the cornice, but higher up the spire, and the upper spire lights more frequently alternated on the diagonal and cardinal sides. Their gables were frequently crocketed, and niches with crocketed gable heads were placed at the apex of the broaches lying back on the spire, as at Ketton.

The spire itself becomes ribbed or ribbed and crocketed along its angles, and has an occasional horizontal band or moulding, and more pronounced mouldings and a more definite cornice mark its junction with the tower.

At length a momentous change takes place—cornice and dripping eaves are alike abandoned, and a passage is made round the base of the spire, probably a practical innovation to facilitate the repair of the spire; for spires were more frequently struck by lightning in those pre-lightning-conductor days than at present. For safety's sake the passage required a parapet. Although the parapet might slightly overhang the faces of the tower, being carried forward on the cornice, especially when pinnacles supported it at the angles of the tower; yet it was necessary to set the spire and its broaches in a little in order to allow room for the passage. And thus commenced

the Shrinking of the Spire.

Woodford is a simple example of a parapet carried round a broach spire, and, near by, Denford, across the meadows of the Nene, has a parapet carried round a spire of the timber type.

Some very fine Steeples

belong to this transitional type, and pre-eminent among these is Grantham. Not far away is Newark, evidently by the same architect. Heckington is a particularly noble steeple of this type. It is of strong outline and fine proportions, and is one of those masterpieces which are independent of any added ornament for their beauty.

In the simple type of broach spire the lines of the broaches are satisfactorily carried down those of the spire to embrace the angles of the tower, and, whether seen in front or diagonal elevation, there was a complete unity between tower and spire. Not so with

the Parapet Spire.

The first effect of the parapet is to introduce strong horizontal lines between tower and spire. Its second is to cause a certain shrinking of the spire to allow a passage round its base. The third is still more important, and more frequent of future development. It results from the fact that, while the apparent breadth of the tower increases from the front and angle elevation in the ratio of the side to the diagonal of a square, that of the octagonal spire remains the same. Hence the spire which seems in correct proportion to the tower on front elevation appears too narrow and shrunken on the angle elevation, and the angle pinnacles in like manner appear to have moved away from it, leaving a disconnecting and awkward gap in the skyline.

The most evident solution of the difficulty, and the one that was at first attempted, was to make the angle pinnacles of the tower so massive and tall that the tower should seem to be carried up into the domain of the spire, and the pinnacles themselves should, on the angle elevation, appear to support the spire

and fill up the gap between its sides and the angles of the tower. These large pinnacles begin to appear, in fact, before the broach has quite disappeared, as at Heckington. Other fine examples are to be found in St. Mary Redcliffe, Bristol, and the western towers of Lichfield Cathedral.

The disadvantage of this arrangement is that the pinnacles tend to block the passage round the spire. At Oakham the pinnacles are connected with the spire by horizontal masses of masonry, which serve as bridges across the passage. It is the embryo of the subsequent flying buttress.

The Solution found at Salisbury.

The second method adopted was to keep the tower pinnacles comparatively low and subordinate them to an inner range which filled the space between them and the spire, as in the central tower at Chichester, or the more magnificent one of Salisbury. In fact, in this grand example the problem seems solved. The inner pinnacles are a mean between the outer pinnacles and the spire; and the eye, following upward the lines of the tower, passes by easy steps from angle pinnacles to inner pinnacles, and from these to the spire itself.

Yet the parapet is not sacrificed; the tower and spire retain their respective characters, and there is not that confusion between them which one finds sometimes on the Continent, as at Frieburg, St. Stephen's at Vienna, in which it is impossible to say where tower ends or spire begins.

An elaboration of this idea

is to be found at St. Mary's, Oxford. Here, in place of the tower pinnacles, each of the pair of buttresses at the tower angles carries an elaborate gabled and crocketed canopy over a sculptured figure, and the inner pinnacles are in two stages, with similar elaborate ornament, the whole combining with the spire lights to form a cluster of richly-decorated gablets and pinnacles, from the centre of which the spire rises.

This type of clustered spire reaches its fullest expression in the south flanking tower of the west front of Peterborough, in which graceful triangular spirelets rise between tower pinnacles and spire, having one side of the triangular base adhesive to the spire and the opposite angle carried by the tower pinnacle, and allowing a clear passageway beneath. The height of the spirelets is so arranged that their apex is on the line drawn from the apex of the tower pinnacles to that of the central spire.

In contemplating such an example as this one recognizes that the central spire is only one of a cluster, and has entirely ceased to represent the tower roof, as in such early broach spires as Frampton. It has, in fact, ceased to be an essential part of the tower, and has become only an ornamental accessory. It is, therefore, sooner or later, doomed to obey the inexorable law of extinction of useless members.

But there was

Yet a Third Way

of connecting angle of tower with spire, and one which became very popular with the Perpendicular architects. It was to put a small pinnacle at the tower angle and connect it with the spire by a flying buttress—a poor contrivance, but serving in some degree to carry the eye over the hiatus between tower, pinnacle and spire on the angle elevation.

The buttress abuts against the centre of the diagonal side of the spire, and seems sadly to lack articulation, and its particular forms suggests resistance to a thrust which, if it existed, would make short work of buttress, pinnacle and all. Higham Ferrers and Rushden may be taken as typical examples of this method, also Moulton and Whittlesea.

The magnificent steeple of Louth is the only one in which the flying buttress seems

worthy of its position—and the one at New-castle in which the flying buttress has run away with the spire!

The Octagon.

We now come to the fourth and last method of uniting tower and spire—by the interposition of an octagon. This occurs in its most rudimentary form at Abingdon, which consists in little more than setting the spire on an octagonal drum, and marking the junction by an embattled string.

At Exton a beautiful little steeple, amid beautiful surroundings of wood and park, affords an excellent example of the employment of the octagon. The tower pinnacles finish in miniature embattled octagons, which assist in harmonizing tower and spire, and giving breadth to the design. The octagon, however, seems so evidently to exist at the cost of the spire that the latter looks somewhat strangled by it.

But you will already have forestalled me and arrived at Coventry first. It is impossible to speak of the association of octagon and spire without immediately thinking of St. Michael's. Whilst elsewhere in the Perpendicular period they were more busy with towers than spires, the Coventry people seem to have reared their spire as a vindication of the spire and a protest at its increasing neglect. And a very noble steeple it is, although it excites our wonder as a *tour-de-force* as much as our admiration as a design. The truth is it looks a little too unstable; attenuation is written on every part; the octagon seems balanced on the tower, the spire on the octagon, and the weak ogee flying buttresses add very little to the sense of stability, and rise too high from the tower pinnacles, which are themselves weak in outline. The corona of open panelling at Patrington serves a similar purpose with the octagon, and may almost be regarded as such. A fine design is here marred by the ridiculous straddle tower pinnacles and their flying buttresses, and the poor belfry windows.

The Famous Perpendicular Spires.

That the Perpendicular builders were sensible of the value of the spire as a crowning feature of the design, the steeples of Coventry and Louth are sufficient witness, and they not infrequently erected timber and lead spires over towers which were otherwise complete without them, as, for example, the three towers of Lincoln.

As Northamptonshire and Lincolnshire, with Peterborough as centre, is the home of the spire, so Somersetshire, with Glastonbury or Wells as centre, developed

The most Important School of Tower Design.

although Norfolk and Suffolk may lay claim to many excellent examples. The Somersetshire type is sufficiently distinctive, notwithstanding considerable variation in individual towers, and it can be at once recognized. Of lofty proportions, these towers are usually divided into three stages by string-courses, and the buttresses, which are in pairs, are set in a little way from the angle of the tower, allowing the string-course to peep out, as it were, at the angle. The parapets are usually embattled, and have pierced traceried panelling, and occasionally, as at Glastonbury and Taunton, are very elaborate. In these cases the angle pinnacles are usually of open tracery work.

There are several fine towers outside the Somersetshire district which belong, more or less, to this type, as at Wrexham and Evesham. St. Neots, near Huntingdon, has an unusually fine tower for the district, with certain points of resemblance to the Somersetshire towers. But the strings and buttress weatherings do not line, the engaged pinnacle is of different design, and the belfry lights are insignificant, and go far to spoil the beauty of the design. The central portion of the parapet is carried up higher than

the sides in a manner peculiar to this eastern district, other examples to be found occurring at Huntingdon, St. Martin's, Stamford, and Wisbech.

Towers with Octagonal Lanterns.

There are a few towers carrying octagonal lanterns, as at Irthlingborough. At Lowick the whole design is of excellent proportion, and the octagon ends in a corona of pinnacles. But the grandest example is to be found at Boston, irreverently called "Boston Stump." The central tower, that crowning glory of the English cathedral, differs from those hitherto described in that it stands on four isolated piers hidden by the adjoining roofs. As a consequence the bold angle buttresses are dispensed with, as there is no support for them, and the tower rises to the parapet without a break in its vertical lines. A comparison between the central and western towers of Canterbury will emphasize this point.

Taper.

With the exception of the central towers, most of them have an upward diminution, not only to give them an air of stability, but, when they carry spires, to counteract the optical illusion of their spreading outwards at the top, due to slope lines of the spire.

This diminution is obtained in various ways: By setting in each stage on the string-course from the stage below, as in the Saxon towers and the lancet towers of West Walton and Walsoken; secondly, by the diminution of buttress projection, as in the vast majority of towers; and thirdly, by giving a batter to the tower or to the buttresses, or both, as at Market Harborough.

Small towers occasionally have no buttresses; the majority have pairs of buttresses, either exactly at the tower angle, as at Grantham, or set in a short distance, as in the Somerset towers; a less number have diagonal buttresses, while not a few have an octagonal thickening at the angles. St. Margaret's, Leicester, has diagonal buttresses set upon the usual pair of buttresses below.

Of the octagonal angled towers

Magdalen Tower, Oxford.

is a fine example. This tower also illustrates an important point in tower design—the severity and plainness of the lower stages, and the increase in lightness, elaboration and ornament towards the top. The fenestration of the Lombard towers followed this principle, and Giotto's campanile is an excellent example of it. Lancet towers, on the other hand, are frequently covered with tiers of arcading over their whole surface, which extend even round the octagonal angles, as at St. Mary's, Stamford and West Walton. Raunds has a unique decoration of zigzag weatherings, with the angles decorated by sunk quatrefoils.

The Staircase Turret

has already been referred to as stopping beneath the broach spire, or even below the belfry stage. Sometimes it is incorporated with the angle buttresses, as at Heckington and Grantham, in the latter case carrying a larger pinnacle than the other tower angles. At other times it projects boldly from the middle of the face of the tower, or near one angle, or at the angle itself, and stops below the parapet or is carried up above it. In the latter case it is often finished with an embattled top or spirelet.

Belfry Windows.

Next to the main lines of stages, buttresses, and strings the belfry windows claim our attention. They are, as it were, the eyes of the tower, and a tower without them, as that to be found at Ringstead, does not look intelligent.

Single belfry lights are to be found at all periods, from Polebrook and Heckington to York and Boston. These are often supported by blank panels at the sides, as at Denford

and Frampton, or, to take later examples, by the traceried panelling of St. Peter's, Derby, and Manchester Cathedral, restricted, in the latter case, to the space above the springing. But the general rule is to group the belfry lights in pairs.

The lights themselves may have heads of all shapes—obtusely lancet, ogee or square-headed, as at Aldwinkle St. Peter's. The transome frequently occurs, and occasionally the jambs and mullions are extended down below the sill to enclose a traceried panel, which may extend to the next string-course, as at St. Cuthbert's, at Wells.

The Stages.

The ringing stage usually has single and less conspicuous windows, although in some of the great towers and steeples there are double and of large proportions and elaborate ornament; examples of such occur at Coventry, Louth, Wrexham and Taunton.

The lowest stage of the tower facing west contains the grand door, for use on State occasions, with the west window over it, forming, in many cases, one composition with it by having its sill on the tower hood mould, as at Northleach, or being included within the same arched recess, as at Whissendine. Many of these west doors are very fine, as at Kettering and Middleton Cheney, and are worthy of independent study. In the Northamptonshire district the west door is recessed with a shallow porch, which further emphasizes its importance. Such occur at Higham Ferrers, at Rushden, and at Keystone. With this Mr. Bidlake brought his paper to a conclusion.

The Discussion.

Mr. G. Fellowes Prynn, proposing a vote of thanks, said he thought the spire, above all other Gothic detail, was the most beautiful; and although it was sometimes considered unnecessary and a luxury it was both exquisite in its form and beautifully symbolical. He regretted Mr. Bidlake had not mentioned the delightful little church at Loswithiel in Cornwall. As regards the wooden spire, beautiful examples existed at Barnstaple and Chesterfield, in both of which, however, the wood was much warped. The subject as a whole was intensely interesting, and he thought we might feel proud of our natural Gothic art and the development of the tower and spire.

Mr. Francis Bond, in seconding, regretted that Mr. Bidlake has not shown them any examples of his own draughtsmanship. He mentioned that the reason why one of the spires at Peterborough was more satisfactory than the other was because one was sixteenth-century work and the other fifteenth-century. At Lichfield they saw the same thing—fifteenth-century work trying to look like that of the fourteenth century.

Mr. Arnold Mitchell suggested that it might not be timber construction from which the spire started. In the history of architectural development they found that as the builders became used to their materials they abandoned perishable materials and began with stone. Their first effort was to roof the tower with stone, and he thought they must have begun with a pyramidal roof which was gradually elongated until it became a spire.

The president also spoke. Mr. Bidlake in reply said he had seen a plan of the Victorian tower at the House of Parliament, and he believed it was intended to be considerably higher. It was now disproportionate, and apparently the architect had to curtail his design through the parsimony of Parliament.

The lecture was illustrated by a large number of lantern slides.

The next meeting of the Association will be held on January 19th, when Mr. Lynn Jenkins will read a paper on "The Consideration of Sculpture by Architects."

Keystones.

A Discussion on Cheap Cottages in Rural Districts took place at last Thursday's meeting of the Society of Architects. It was opened by Mr. J. R. Manning.

A new Foresters' Hall at Debenham, Suffolk, has been built from designs by Mr. Raymond C. Wrinch, A.R.I.B.A., of Ipswich and Felixstowe.

Mr. Val Myer, A.R.I.B.A., of 14, South Square, Gray's Inn, has joined with Mr. John W. Fair. The firm will now practise at 39, Farnival Street, Holborn as "Fair & Myer."

At Woolwich Town Hall a statue of Queen Victoria by Mr. Pomeroy—a replica in marble of his bronze statue at Chester—was unveiled recently by the Duke of Connaught.

Beth Hamedrash—primarily intended for the study of Holy Law, but actually the Jewish ecclesiastical court—was opened last week. It is in Mulberry Street, Commercial Road, London, E.

The Brazen High Street of Kensington.—"Think of High Street, Kensington, of no more than ten years ago, and come and see the bloated, brazen, blithering, roaring, rampant highway that has taken its place," said Mr. Louis N. Parker at last week's meeting of the Society of Arts.

The "Gloucester Diary" for 1906 has just been issued by the Gloucester Railway Carriage and Wagon Co., Ltd. A new feature in the book is a "Director's Calendar" and a note on each day throughout the diary to enable the periodic recurrence of fixed engagements to be recorded, such as board or council meetings.

Mr. George E. Wade, the well-known sculptor, has received a commission for a statue of Her Majesty for the London Hospital. Mr. Wade is also entrusted with the execution of another statue of Her Majesty for Hong Kong. He is at present engaged in completing the panels of the Natal Volunteer War Memorial which is to be erected in Pietermaritzburg by the Natal Government at a cost of £7,000.

The Manchester Society of Architects held its forty-second annual dinner on Wednesday last, Mr. J. H. Woodhouse, president, in the chair. Mr. Ogden announced that the late Mr. A. W. Mills, architect, of Manchester, had left the Society £8,000 for the establishment of a home of its own. Toasts were given and responded to by Mr. Charles H. Heathcote, Councillor J. H. Thewlis (Lord Mayor of Manchester), Professor Capper, Sir James Hoy, Mr. John Brooke, Mr. Charles Hopkinson, Mr. Edgar Wood, Professor Schuster, Mr. J. D. Mould, Mr. A. S. Brewis, and the president. Mr. Edgar Wood expressed regret that one of the noblest of Manchester's possessions, the old town hall, was to be lost without any great effort being made to save it. Speaking of the same building, the Lord Mayor said he would have been extremely glad if this very fine example of Grecian architecture could be retained, but the City Council had to consider the good of the community, and it was absolutely necessary that Cross Street should be widened at that point.—At last week's meeting of the Society Mr. S. Harold Gibbons read a paper on the sketching of churches. He strongly advocated the making of large sketches, and discussed the advantages of plotting measurements on the spot. Two methods which were thought rather novel were the uses of a "fishing rod" and a two-foot rule, the first for obtaining heights of groined vaults and the latter for the plotting of the inclining angles of perspectives by holding one arm of the rule vertical and gradually depressing the other arm until coincidence was obtained—then transferring it to the paper.

New Buildings for the Marylebone Presbyterian Church, in Upper George Street, were opened last Wednesday by Lord Macnaghten. Mr. William Flockhart was the architect.

The new Workhouse Infirmary at Stepping Hill, Stockport, recently opened, will accommodate 340 patients. The cost is put at £130 per bed. Mr. W. H. Ward, of Birmingham, was the architect.

The new Infectious Diseases Hospital at Melton Mowbray was formally opened last week. The accommodation is for twenty beds. The total cost has been £9,000. Mr. Edmund Jeeves was the architect and Messrs. T. & H. Denman were the builders—both of Melton Mowbray.

Rothsay Harbour Buildings.—Designs have been prepared by Mr. James Miller, F.R.I.B.A., for the proposed reconstruction of the harbour buildings at Rothsay. These show an overhead promenade to accommodate several thousands of people, with a pavilion for use in wet weather. The total outlay is put at £10,000.

Reinforced Concrete was dealt with by Mr. T. J. Gueritte at last Wednesday's meeting of the Edinburgh Architectural Association (Mr. H. O. Tarbolton, F.R.I.B.A., president, in the chair). The lecturer referred particularly to the Hennebique system, and explained its uses, advantages and various applications to building bridges, foundations, reservoirs, &c.

A new Portfolio of Measured Drawings.—Mr. Charles H. Reilly, professor of architecture at the University of Liverpool, proposes to issue yearly, in folio form, a selection of measured drawings made by his students, somewhat similar to the Sketch-book of the Architectural Association, but with a cover of linen boards, either as a portfolio or as a bound volume. Professor Reilly sends us an example from the portfolio—the splendid building of the Customs at Dublin—accompanying which in the proposed volume will be three sheets of details. The first number of the publication will contain in addition a complete external survey of the Town Hall, Liverpool; the Senate House, Cambridge; the Palace of the Petit Trianon, Versailles; the Palace of the Grand Trianon, Versailles; the Orangery, Kensington Palace; and other smaller contributions. Considerable expense is entailed in the reproduction of these drawings, and Professor Reilly hopes to be able to count on the support of many architects, especially of those practising in Liverpool. The price to subscribers is 12s. 6d. a volume, and to the general public 15s. nett.

The Clarion Guild of Handicraft held its annual exhibition in the picturesque old hall of Clifford's Inn last week. At the opening of the exhibition on Wednesday Mr. Walter Crane said that artists nowadays had too strong a tendency to be fantastic, and in their desire for originality at times forgot the way to useful things and subjects. Mr. Selwyn Image observed that machinery had not done for the world what people thought it was going to do, and a growing number of people realized that it stood in the way of the millennium, instead of hastening it. The voice of John Ruskin cried aloud in the wilderness when he raised it against the effects of machinery upon human life. The practical common-sense man implored Ruskin to confine himself to his proper business of criticizing Turner and the Italian painters, and not to meddle with social questions. After Ruskin came Morris, who taught in a different way the same doctrine as Ruskin. It was in the spirit of the two great masters that this guild had come into existence. The studio-workshop of the London branch is at 48, George Street, Hampstead Road. Members pay an entrance fee of 2s. 6d. and a subscription of 6d. per week for the use of workshop and tools.

National Memorial to Queen Victoria.—The mound in front of Buckingham Palace is now being cleared for the foundations of Mr. Brock's work.

"Hints on Building a Church," by Henry Parr Maskell, has just been published from the office of "Church Bells," Tower Street, E.C., price 5s.

Herculaneum.—It will be remembered that some time ago Professor Waldstein mooted the scheme of excavating Herculaneum. The proposal is now under consideration by the Central Commission of Antiquities and Fine Arts at Rome.

A.A. Students' Smoking Concert.—The students of the Architectural Association will hold their second annual smoking concert on Friday, February 2nd, in the Georgian Hall of the Gaiety Restaurant. Any balance accruing will be divided between the Architects' Benevolent Society, and the musical society which is being formed in the Association.

Change of Addresses.—Owing to increase of business Messrs. Denny, Mott & Dickson, Ltd., timber merchants, have had to take larger offices at 13, 14 and 15, Fenchurch Street, London, E.C.—Mr. Paul Waterhouse has transferred his offices from New Cavendish Street to Staple Inn Buildings, Holborn Bars, W.C. Telegraphic address (as at present) "Ædilis, London." New telephone No. 2399 Holborn.

Birmingham Soldiers' Memorial.—Mr. Albert A. Toft, to whom was entrusted the task of designing the Birmingham Soldiers' Memorial, which is to be placed in Cannon Hill Park, has finished his work upon the group of statuary, and the casting in bronze is now proceeding under his supervision. It is anticipated that the memorial will be ready for unveiling next May. The stone pedestal will be 16ft. high and 20ft. in diameter at the base.

Egypt Exploration Fund.—The financial report of the hon. treasurer for 1904-05 states that the total expenditure was £3,215, while the assets on July 31st last were only £2,377. The deficit is due to the Fund having undertaken two expeditions and to the falling-off in the subscriptions from America. In future, therefore, the scope of the Fund's work will have to be brought within a more limited area. During the past season work has been carried on in two directions—by Professor Petrie in the Sinai Peninsula, and by M. Naville and Mr. Hall. Many interesting discoveries have been made by Professor Petrie, the most remarkable remains found being those of the temple at Sarabit. Sir John Evans now retires from the presidency of the Fund, after occupying that position for seven years.

Street Widening and Compensation.—An important question in reference to the widening of public streets when existing buildings come to be rebuilt was submitted for the opinion of counsel in London recently by the Corporation of Glasgow. In Glasgow it is contended that under an Act obtained in 1900 no compensation can be claimed unless the Corporation compel a house to be pulled down and rebuilt further back. If the rebuilding is done at the instance of the proprietor, then, if the building is in the new register of public streets, it is argued that the Corporation can insist on the new erection being put back to what the Master of Works has entered in the register as the fair and ultimate width of the street. The proposal of the Corporation was resisted by the property-owners, who maintained that the Master of Works should only enter in the register of public streets the actual width, and if the Corporation desired an ideal width they should purchase the requisite property.

A Bronze Statue of John Knox is to be placed in St. Giles's Cathedral, Edinburgh.

Mr. Mervyn Macartney is gone to South Africa to assess the competition for new law courts at Cape Town.

The Garden City Magazine is now published. It will be issued monthly from January 15th next and will be sent free to all members of the Association.

The T-Square Club.—At last week's first general meeting held at the Monico it was agreed to wind up the T-Square Club as at present constituted and to form a new club, the annual subscription to which will be one guinea; a half session of the club, however, is to be formed immediately after Christmas with a subscription of half a guinea. Mr. W. H. Webber, of 7, Great James Street, Bedford Row, W.C., is the hon. secretary. The first social evening of the club will be held on Tuesday, January 22nd.

Trade and Craft.

Combined Sprinkler and Fire-alarm.

An interesting demonstration was given on November 28th at the premises of the London Essence Co., George Street, Camberwell Green, London, S.E., of a combined sprinkler and fire alarm system which has been installed throughout these works. Several tests were performed to show the quickness with which the system detects and extinguishes an outbreak of fire. The first test took place in a room 26ft. by 25ft. by 12ft. 6ins. high. From the lighting of the fire the alarm sounded in 27 secs., and 10 secs. later four sprinkler heads attacked and extinguished the fire. In the second test in a smaller room the alarm acted in 23 secs., and 10 secs. later a sprinkler acted. A third test of a more severe character was performed in a covered way measuring 30ft. by 20ft. by 17ft. high, entirely open in front and partly open at one side. Notwithstanding a breeze blowing, the detectors acted in 17 secs. and three sprinklers in 57 secs. This shows how very quick this system is in action, a point of the utmost importance. This system is worked on an entirely different principle to the ordinary electric alarms, consisting of small tubing under pneumatic pressure. Any rise of temperature causes a stretched wire to slacken and release a suspended weight, which smashes a glass bulb inserted in the pneumatic tubes. This immediately relieves the pressure in the tubes and causes the alarm to sound. It is apparent that the system is superior to an electric one in so far as there are no electric wires to cause a danger of short-circuit and false-contact calls, while the severance of the tube does not mean the failure of other detectors on that circuit, as in the case of electric wiring. A valuable feature is that the expansion wire being placed on a metal plate which expands with a slow rise of temperature, the alarm will only be given with a sudden rise of temperature. The pneumatic alarm system seems to possess every good point that the electric systems do. Apparently its cost of maintenance is very low, and by an ingenious method of arranging the pipes it will show the particular floor where a fire occurs. The sprinkler has an arrangement of a falling weight which smashes a glass bulb very much in the same way as the alarm. The release of pneumatic pressure in the alarm tubes lets into the piping the water which had been held back by a valve. This overcomes the danger from frost to a system where the water is always in the pipes and does away with corrosion, while the water not being released until the alarm acts, no damage will result if a sprinkler head is accidentally opened. The address of the Expansion Sprinkler Syndicate, Ltd., is 58a, Fountain Street, Manchester.

NOTES ON COMPETITIONS.

Two more unsatisfactory Competitions.

FINE feathers make fine birds, but fine paper does not necessarily make fine conditions. The Education Committee of the King's Norton and Northfield Urban District Council has issued a set of conditions which leave nothing to be desired as far as external appearances are concerned. They are excellently printed upon stout paper, are handy of size, and, moreover, may be obtained free, i.e., no deposit is required. These circumstances make a perusal of the contents little short of pathetic. A school is to be erected in Raddle Barn Lane, Selly Oak, to accommodate 1,200 children, boys, girls and infants (400 in each department), at a cost not to exceed £14 per scholar. Firstly, no premiums are offered. Secondly, there is to be a duly qualified assessor, but he is to assist the committee in the selection of the designs. Thirdly, the commission will be at the rate of 5 per cent. on the gross cost of the buildings erected, but it is only intended to proceed with the infants' department in the first instance, and no sort of remuneration is offered on account of the deferred two-thirds of the work. Fourthly, the whole of the drawings, specifications, estimates and other documents connected with the accepted design are to become the sole and absolute property of the committee. Fifthly, the amount of work which is required of the architect, and for which no extra payment will be made, is excessive and unreasonable; he is to furnish such plans and tracings as may be required by the Board of Education, the Local Government Board, the King's Norton and Northfield Urban District Council and the contractor. Sixthly, there is an awkward clause governing the cost of the building, making the limit of expenditure vague, for it is stated that the cost of the building will be an important element in determining the competition. Furthermore, if it is found, upon opening the tenders, that the cost is in excess of the architect's estimate, he shall not be entitled to the execution of the work, nor shall he have any claim against the committee. The usual safety margin of 7½ or 10 per cent. is not provided for. This practically means that working drawings, specifications and quantities have to be prepared and tenders obtained before the successful competitor's design is accepted. Seventhly, the committee reserve the right to exhibit publicly only the designs recommended by the assessor. Eighthly, a rough plan of the site is provided, but its accuracy has to be verified by the competitors, and it carries no information as to levels. In addition to having to supply plans to the several bodies already mentioned, the successful competitor has apparently to find his own travelling and out-of-pocket expenses, for these are not mentioned in the conditions. An extraordinary clause is one which requires that proper attachments should be made in the heating apparatus (low-pressure hot-water system) at convenient places for the supply of hot water for cleaning purposes. The value of the water so obtained as a cleanser and the effect upon the heating system of drawing-off are, as is well known, most unsatisfactory. This is another instance of the folly of issuing a set of conditions without the aid and before the appointment of a properly qualified assessor. It is but fair to note that the statement that the assessor is to assist the committee in the selection of designs is in accordance with the R.I.B.A.'s "Regulations." The wording of this particular regulation is open to criticism, for if accepted literally by promoters it gives them the power to disregard the assessor's selection. This is the one weak spot in an otherwise good set of regulations for the conduct of architectural competitions. It is extraordinary

that the King's Norton authorities should advertise an open competition and issue conditions without requiring a deposit and yet not be able to supply an authentic site plan with levels. Do they think it reasonable to expect competitors to travel from all parts of the kingdom at their own expense, burdened with chains and levels, to obtain particulars at a cost which, if taken collectively, is comparatively enormous? A little forethought would have enabled them to have issued these particulars at about half what it will cost any individual competitor. But this is only another instance of the lack of consideration so constantly shown by promoters towards those whose services they are so anxious to obtain.

Proposed Carnegie Free Library, Beal Lane, Shaw, for the Crompton U.D.C.

If the case of King's Norton is pathetic, that of Crompton is absolutely humorous, for their requirements are so appalling and so unblushingly stated that they can only be regarded as "teeming with quiet fun," to use a Gilbertian phrase. This library is to contain, if possible, large reading-room, ladies' reading-room, boys' reading-room, reference reading-room, lending library to hold 15,000 volumes, librarian's room; and, in the basement, store-room, mending-room, lavatories, w.c.'s, and heating apparatus.

A flagstaff is to be fixed in some convenient part of the building. The roofs are to be covered with Ruabon red tiles. The reading-rooms are to have double windows. All internal joiner's work is to be of oak. The cost of this building is not to exceed £3,000. The Crompton Urban District Council have evidently been badly treated over a library on a former occasion, for they impress upon competitors the necessity of not forgetting the painting and the lending-library counter. The £3,000 is to include architect's and quantity surveyor's fees. In addition to providing a library at half its legitimate value, the successful competitor is expected to give his services for nothing. This is not actually stated—in fact a commission of 5 per cent., which is to include travelling expenses, is offered—but competitors are to state in their reports what amount they will allow out of this remuneration towards the salary of the clerk of works. A short calculation will show the humour of this requirement. £3,000—fees = say £2,800; architect's fee is 5 per cent. of £2,800 = £140; let the clerk of works salary = £110, and let out-of-pocket expenses = £30; therefore, the clerk of work's salary and out-of-pocket expenses equal together the architect's fee. One wonders what manner of man it is who sits upon this council. Be he a doctor, would he use his fee earned by attendance and physic to supply his patient with a trained nurse, a solicitor, and supply his clients with the services of counsel, a butcher, and pay the wages of his customer's cook? Even the first premium of £30 is to merge, so there is not even that left to buy paper and pencils with. It is printed in the conditions that the council "reserve the right either to themselves decide regarding the designs, to call in an assessor to advise them, or to reject the whole of the designs." At this point the council appear to have experienced a twinge of conscience; perhaps it was the sight of their split infinitive acting on their overwrought nerves, for appended to the announcement, in writing, are the words, "*An assessor will be appointed.*" It is anticipated that the dazzling prospect of speedily amassing a competence will cause the successful competitor to wander unwittingly from the path of rectitude, so he is warned in a manner reminiscent of the seaside apartment bed-head text, "No charge whatever in respect of commission must be made on the contractor." Here, as at King's Norton, disqualification is the penalty of an excess of the contractor's estimate over that of the

architect, who, in this contingency, will be subject to summary dismissal without remuneration. Also, it is necessary to verify the accuracy of the site plan and levels by a visit to Shaw, which is Oldham way. The inclusion of a flagstaff in the list of requirements is a master-stroke.

Preston Higher Grade School Competition.

A protest is contemplated in reference to this award. Any competitor desirous of being associated with the same can have a copy upon application to Mr. G. H. Willoughby, 3, York Street, Manchester, or Messrs. Edgar Wood & Sellers, 78, Cross Street, Manchester.

Perth City Hall Competition.

The report of Mr. Burnet, the assessor in the competition for the proposed rebuilding or reconstruction of the city hall at Perth, was considered by the town council in committee on December 7th. Dean of Guild Barlas moved that the Council resolve to adopt the reconstruction scheme. Councillor M'Pherson moved as an amendment that further information be got as to the relative costs of the successful plans. Lord Provost Cuthbert urged that the Council delay consideration for a month. On a division thirteen voted for the motion and eight for delay. The whole question will be discussed at the next monthly meeting of the town council.

A Northampton School Competition.

The Northampton Borough Education Committee recently invited competitive designs for a new Council school to be erected in St. George's Street and Royal Terrace. Twenty-five sets of plans were sent in and Mr. H. O. Creswell, F.R.I.B.A., was the assessor. The first place has been awarded to Mr. Matthew H. Holding, A.R.I.B.A., and the second place to Messrs. Herbert Norman and W. D. Gibbins. The building will accommodate 350 boys, 350 girls and 410 infants.

Correspondence.

Comparative Cost of Working Hydraulic and Electric Lifts.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—We read with very much interest the article in your issue for November 15th on the comparative advantages of hydraulic and electric lifts, and we consider that in the main it is an exceedingly fair statement of the question under discussion. We quite agree with the remarks about the suitability of hydraulic power for working lifts and cranes, but we think in one point the case for the Hydraulic Power Co. has been somewhat overstated, namely, as regards the comparative cost of motive power. We see that in the article a statement is adopted from Hydraulic Power Co.'s pamphlet to the effect that if the working cost of an electric lift is based on equal loads in both directions the variation in the cost, owing to greater loads ascending and less loads descending, may be increased by about 50 per cent. We venture to think that this is somewhat an overstatement of the case, because with an electric lift carrying five persons (or $7\frac{1}{2}$ cwt.) the balance weight would exceed the weight of the cage by about $3\frac{1}{2}$ cwt., and though the variation between the current consumption when running in both directions with full load, and when running up with full load and down empty, would amount, as stated, to about 50 per cent., it must be borne in mind that with a passenger lift the attendant will always be travelling with the cage; and assuming that a lad would weigh about 1 cwt., this means that the variation between the average duty and full duty would be reduced to about 25 per cent.

Beyond this, our experience teaches that the number of journeys under maximum conditions as suggested would probably not be more than about 10 per cent. of the whole

journeys, as in most cases probably about two persons and the attendant would be going up, and one person and the attendant coming down; there are also, of course, occasions when the duty will be less than the average.

We should think therefore that the variation above the balanced load would not really amount to more than 5 per cent. in the course of a week's running, instead of 50 per cent. as suggested by the Hydraulic Power Co. We would suggest that this consideration is one which should be rather urged by the Company than objected to by them, because one of the great points claimed for an electric lift is that the power consumed varies in proportion to the actual duty performed, but our view is that the difference between the maximum load and the minimum load is so comparatively small that this advantage is more theoretical than actual as regards its result on the year's current bill.

As we make a large number of both classes of lifts, we are of course in a position to take quite an impartial view, and in advising our clients in any question we should take into consideration all the circumstances of the case and advise accordingly. There is no doubt, however, that as regards cost of motive power electricity has a great advantage under present conditions, and this will be increased when current is supplied (as it will be next year in a great part of London) at a cost of only 1d. per unit.—Yours truly,

D. W. R. GREEN

LONDON. (for R. Waygood & Co., Ltd.)

King's Norton School's Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Referring to your notice in last week's issue on the competition for new council schools for the King's Norton Urban District Council, there seem to be two or three points which are a little unreasonable, namely, the successful competitor must furnish tracings for the Board of Education, the Education Committee, the Local Government Board, the King's Norton Urban District Council, and of course the usual builder's copy or copies—making at least five copies, all without extra charge. Although no premiums are offered the council claim the successful competition drawings. The assessor is appointed to assist the committee in judging the drawings, and I have heard privately that there is a section of the committee which is determined to support the assessor's award.—Yours truly, X.

A History of Architectural Development.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Whilst thanking you for the notice on my book in your issue for December 6th I venture to think that the words in parentheses in your last sentence are calculated to convey a false impression; a result which I feel certain you did not intend. They suggest that I have not "personally investigated" the work I write about. It is true that I have not seen the buildings of Egypt, Assyria and Persia, and I state this fact in my preface; but the descriptions and illustrations of these (including churches in Egypt and Syria) only take up sixty-four pages out of the 259 in the book. Of the buildings described in the remaining pages (Greek, Roman, Byzantine and early Christian) there are not more than half a dozen that I have not visited and studied.—Yours truly,

F. M. SIMPSON.

UNIVERSITY COLLEGE, LONDON.

[Our point was that Mr. Simpson had not personally investigated the sources which alone can enable an adequate view to be obtained of early Grecian, Roman, Byzantine and Christian architecture, and for this reason he has given an inadequate account of the beginnings of architecture, but this first volume contains much that is valuable, as we said in our review.—Ed. B.J.]

MANCHESTER NOTES.

(By our Own Correspondent.)

The Unemployed.

THE leading article on "The Unemployed and the Building Trades" in THE BUILDERS' JOURNAL for December 6th is particularly opportune and of much local interest. With the exception of London, perhaps, there is no district in which more is being heard of the unemployed than at Manchester. We have had frequent meetings in the principal square, processions, and a dramatic collision with the police, which was not altogether above suspicion. Election meetings have been invaded and upset by labour men and socialists, the labour representatives in the City Council are insistently and violently advertising their cause, and the newspapers contain their contributions almost daily. Yet, judged by any test which can be applied, the unemployed question is far less acute than in most years. Excepting the building trade, almost all branches of trade in this neighbourhood are good and are still improving. Some recent cases deepen the unpleasant suspicion that the present agitation is partly the work of clever organizers, who see in the wave of public sympathy and in the political conditions of the moment a good opportunity to further their socialistic ideas. If honest and hard-working traders are not to be crushed out of existence by the cost of free breakfasts, extravagant labour schemes, and the like, a firm stand must be made and a drastic system of investigation and classification insisted upon. At the last meeting of the Manchester City Council the question came up in the form of a proposal that an area of land on the Corporation's Blackley estate should be laid out and streets formed to provide immediate work for the unemployed, and to extend the housing scheme of the Corporation. So far this scheme has proved to be a huge financial failure, a result which supports the Birmingham and Glasgow authorities in their contention that it is sufficient for the municipality to demolish old insanitary property; the demand for new houses invariably creating an ample supply. In spite of a violent speech by one of the labour members, the housing part of the proposal was defeated. In Salford the River Irwell Conservancy Committee will find employment for 200 men for fifteen weeks in the extension of the filter area of the sewage works.

With the new year it is to be hoped that the builders and contractors may obtain a share of the general improvement, but the hope does not receive much support from a round of interviews with the principal architects. Few, indeed, are able to report even the average run of good building contracts in prospect.

Granite for South Africa and New Zealand.

A distinctly new incident in local trade is the shipment by Messrs. Kirkpatrick Brothers, of the Manchester Granite Works, Trafford Park, of about fifty cases of polished granite for Johannesburg. The granite is supplied to the order of Messrs. McIntosh and Moffat, of that town, for the new offices of the National Mutual Assurance of Australasia. Messrs. Kirkpatrick Brothers also have in hand a large polished granite pedestal for the statue of Sir John Logan Campbell to be erected in Auckland, and a number of other monuments, of various designs, for shipment to New Zealand. The local development of this hitherto strictly Aberdeen trade is due to the shipping facilities offered by the Manchester Ship Canal.

Builders' Notes.

Tenders for the Erection of Liverpool Cathedral will be invited shortly.

Sunderland and District Building Trade Employers' Association.—Mr. W. B. Cooper has been elected president of this Association.

Messrs. Colledge & Bridgen, of Midland Works, Wolverhampton, have recently supplied more than 10,000 of their locks and furniture, and 500 sets of their fanlight gearing (to open 1 to 9 lights per set), for the new barracks on Salisbury Plain.

Messrs. Mellowes & Co., Ltd., of Corporation Street, Sheffield, and 28, Victoria Street, Westminster, have secured the order for supplying and fixing their patent "Eclipse" roof glazing on the extensions of the Ordnance Works at Coventry, Messrs. Cammell, Laird & Co.'s works at Sheffield, and extensions to Crewe Station for the London and North Western Railway.

Midland Plastering Co., Ltd.—This company, formed six years ago by the principal Nottingham contractors during the dispute with the operative plasterers, has just held its sixth annual general meeting at the registered office at Pentinck Buildings, Nottingham, when a very satisfactory report was laid before the members. In spite of the very quiet state of the trade in the district, good progress has been made, not only in the original branches of plastering and building materials, but also in the new branch of mosaic work and wall and floor tiling (carried on as the Midland Art Paving Co.). The directors were able to declare a dividend of 10 per cent. for the fourth time, besides carrying forward a substantial sum to the current account. The retiring directors consented to remain in office for the coming year.

Engineering Standards Committee: Progress of Work.—A booklet has just been issued by the Engineering Standards Committee setting forth the progress of the work from January, 1901 to July, 1905. The sectional committee on steel for bridges and building construction have drawn up a standard specification, and the draft has been submitted to the Science Standing Committee of the Royal Institute of British Architects, and will, it is hoped, be ready for publication soon. The sub-committee on cast-iron pipes for water, gas, electrical and sewage mains and the sub-committee on such pipes for heating, ventilating and house drainage are both engaged in drafting a series of standard sizes. A series of standard sizes for smoke pipes is also under consideration. The standard specification for Portland cement was issued last December. The offices of the Committee are at 28, Victoria Street, S.W.

New Companies.

SCARBOROUGH ESTATE, builders, &c. Capital: £5,000.

MERSEY BUILDING CO., LTD. Capital: £500.

BEDWORTH BRICK CO. Capital: £6,000.

MILBURN ESTATES, LTD., builders and contractors, &c., Newcastle-on-Tyne. Capital: £300,000.

COLLAS PORTLAND CEMENT CO., LTD. Capital: £52,500.

WEBER STEEL-CONCRETE CHIMNEY CO., LTD. Capital: £10,000.

LONDON AND PROVINCIAL FREEHOLD AND LEASEHOLD PROPERTY INVESTMENT TRUST, LTD., builders and dealers in building materials. Capital: £50,000.

THAMES STONE CO., LTD., to acquire the business carried on by G. Briggs at Corporation Wharf, Barking, and to carry on the business of granite and stone merchants, &c. Capital: £5,000.

ADVANCE ENAMEL AND VARNISH CO., LTD., to acquire and carry on the business of enamel and varnish manufacturers, &c., carried on by T. Pittman at Plymouth. Capital: £15,000.

LISCANNON QUARRY CO., LTD., to adopt an agreement between W. Kevan and T. W. Kniveton for the acquisition of the right to quarries of stone and flags on four acres of land in the Barony of Corcomrie, co. Clare, Ireland. Capital: £10,000.

Current Market Prices

FORAGE.

		£ s. d.	£ s. d.
Beans	per qr.	1 13 0	1 15 0
Clover, best	per load	3 12 0	4 0 0
Hay, good	do.	3 5 0	3 17 0
Sainfoin mixture	do.	3 5 0	3 15 0
Straw	do.	1 8 0	1 14 0

OILS AND PAINTS.

Castor Oil, French	per cwt.	1 1 10	1 2 15
Colza Oil, English	do.	1 5 0	—
Copperas	per ton	2 0 0	—
Lard Oil	per cwt.	2 15 0	2 17 0
Lead, white, ground, carbamate	per ton	16 0 0	—
Do. red	do.	15 0 0	0 19 0
Linseed Oil, barrels	per cwt.	0 19 9	—
Petroleum, American	per gal.	0 0 7½	0 0 7½
Do. Russian	do.	0 0 6½	0 0 6½
Pitch	per barrel	0 8 0	—
Shellac, orange	per cwt.	9 0 0	9 1 0
Soda, crystals	per ton	3 2 6	3 5 0
Tallow, Town	per cwt.	1 5 9	—
Tar, Stockholm	per barrel	1 5 0	—
Turpentine	per cwt.	2 8 6	—

METALS.

Copper, sheet, strong	per ton	95 0 0	—
Iron, Staffs., bar	do.	7 0 0	8 10 0
Do. Galvanized Corrugated sheet	do.	12 0 0	12 5 0
Lead, pig, Soft Foreign	do.	17 1 3	—
Do. do. English common brands	do.	17 6 3	—
Do. sheet English, 3lb. per sq. ft. and upwards	do.	17 0 0	—
Do. pipe	do.	17 10 0	—
Nails, cut, 3in. to 6in.	do.	9 5 0	—
Do. floor brads	do.	9 0 0	—
Steel, Staffs., Girders and Angles	do.	6 15 0	7 5 0
Do. do. Mild bars	do.	7 5 0	7 10 0
Tin, Foreign	do.	166 0 0	166 10 0
Do. English ingots	do.	168 15 0	—
Zinc, sheets, Silesian	do.	31 7 6	—
Do. do. Vieille Montaigne	do.	31 10 0	—
Do. Spelter	do.	28 15 0	29 0 0

TIMBER.

Soft Woods.

Fir, Dantzic and Memel	per load	2 15 0	5 0 0
Pine, Quebec, Yellow	do.	4 2 6	7 10 0
Do. Pitch, American	do.	2 19 0	5 0 0
Laths, log, Dantzic	per cu. fath.	4 0 0	6 0 0
Deals, Archangel, White, 1st, 3x11	per std.	14 5 0	—
Do. do. do. 2nd, 3x11	do.	11 0 0	—
Do. do. do. 2nd, 3x10	do.	9 5 0	—
Do. do. do. 3rd, 3x9	do.	9 5 0	—
Do. do. do. Yellow, 2nd, 4x11	do.	17 15 0	—
Do. do. do. 2nd, 3x11	do.	17 5 0	—
Do. do. do. 3rd, 4x11	do.	12 10 0	—
Do. do. do. 3rd, 3x11	do.	10 15 0	—
Do. do. do. 3rd, 3x9	do.	10 10 0	—
Do. Nederkalix, Yellow, 1st, 4x9	do.	11 10 0	—
Do. do. do. 1st, 3x9	do.	10 15 0	—
Do. do. do. 1st, 2½x7	do.	10 0 0	—
Do. do. do. 2nd 4x11	do.	9 0 0	—
Do. Brahestad, Yellow, Unsorted, 4x8	do.	9 5 0	—
Do. St. Petersburg, Yellow, 1st, 3x10	do.	10 5 0	—
Do. do. do. 1st, 2½x7	do.	9 10 0	—
Do. do. do. 2nd, 3x11	do.	9 5 0	—
Do. do. do. 2nd, 3x9	do.	9 15 0	—
Do. do. do. 2nd, 2½x7	do.	9 5 0	—
Do. do. do. 3rd, 3x11	do.	7 10 0	—
Do. do. do. 3rd, 3x9	do.	8 0 0	—
Do. Quebec, Yellow Pine, 1st, 3x11	do.	23 5 0	—
Do. do. Spruce, 2nd, 3x7	do.	8 10 0	—
Do. Mesane, Larch, Unsorted, 3x10	do.	9 0 0	—
Do. do. do. 3x9	do.	9 5 0	—
Do. Oxelosund, Yellow, 2nd, 3x7	do.	8 10 0	—
Do. Lewisport, Pine, 3rd, 3x7	do.	8 10 0	—
Do. Gamleby, Yellow, Unsorted, 3x4	do.	7 10 0	—
Battens, all kinds	do.	6 10 0	9 10 0
Flooring Boards rin. prepared, 1st	per square	0 9 0	0 11 0
Do. 2nd	do.	0 8 9	0 10 0
Do. 3rd, &c.	do.	0 7 0	0 9 0

HARD WOODS.

Ash, Quebec	per load	4 0 0	7 15 0
Birch, New Brunswick	do.	2 7 6	4 10 0
Do. Quebec do.	do.	2 12 6	5 0 0
Box, Turkey	per ton	7 0 0	20 0 0
Cedar, Cuba	per ft. sup.	0 0 3	0 0 4
Do. Honduras	do.	0 0 6½	—
Do. Tobasco	do.	0 0 5½	—
Elm, Quebec	per load	4 5 0	8 10 0
Jarrah, plank	per ft. cu.	0 2 6	0 3 0
Mahogany, Average Price for Cargo, Honduras	per ft. sup.	0 0 5½	—
Do. Tobasco	do.	0 0 5½	—
Do. Cuba	do.	0 0 4½	—
Do. African	do.	0 0 3½	—
Oak, Wainscot	per log.	3 15 0	7 5 0
Teak, Indian, logs	per load	10 0 0	19 0 0
Do. do. planks	do.	13 0 0	20 0 0
Whitewood, American, logs	per ft. cu.	0 1 3	0 1 6
Do. do. planks and boards	do.	0 1 3	0 3 0

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING :				
Dec.	21	Annan—Buildings, &c.	Gas Co.	Secretary, Gas Co., 26 High Street, Annan.
"	21	Worthing—Alterations	Corporation	F. Roberts, Borough Surveyor, Worthing.
"	21	Gateshead—Fire-brigade Station	Town Council	N. Percy Pattinson, Borough Engineer, Town Hall, Gateshead.
"	22	Penyrheolgerrig—School	Education Committee	J. Llewellyn Smith, Architect, Central Chambers, Merthyr Tydfil.
"	23	Sligo—Warehouse Premises	H. Lyons & Co.	Graeme-Watt & Tulloch, Architects, 77A Victoria Street, Belfast.
"	25	Llanaelhaiarn—Shed	—	J. H. Thomas, Secretary, 14 Market Street, Carnarvon.
"	26	Elgin—Cemetery Extension	—	J. Wittet, Architect, Elgin.
"	27	Lowestoft—Mortuary	Corporation	G. H. Hamby, Borough Engineer, Town Hall, Lowestoft.
"	27	Pontmorlais—Hall and Vestries, &c.	—	A. Marks, Architect, Glebeland Street, Merthyr.
"	27	Bradford—Post-office Enlargement	H.M. Office of Works	Secretary, H.M. Office of Works, Storey's Gate, S.W.
"	28	Blackley—Infirmary, &c.	Guardians	T. Worthington & Son, Architects, 46 Brown Street, Manchester.
"	28	Brynteg—Villa	D. Phillips	C. M. Davies, 112 High Street, Brynteg, Merthyr.
"	29	Carmarthen—Post-office	H.M. Office of Works	Secretary, H.M. Office of Works, Storey's Gate, London, S.W.
"	29	Caerau—Hospital	Rural District Council	J. H. James, Architect, 18 Quay Street, Cardiff.
"	30	Preston—School	Education Committee	Education Offices, Lancaster Road, Preston.
"	30	Docking—Repairs	Guardians	J. Morris, Surveyor, Dorset House, Heacham.
"	30	Llandaff and Dinas Powis—Hospital	Rural District Council	J. H. James, 18 Quay Street, Cardiff.
1906.				
Jan.	1	Romford—Class-rooms, &c.	Education Committee	Education Committee's Office, 44 Eastern Road, Romford.
"	2	London, S.E.—Sorting-office	H.M. Office of Works	J. Wager, H.M. Office of Works, Westminster, S.W.
"	3	Newport—Extension, &c....	Gas Co.	T. Canning, Engineer, Gasworks, Mill Street, Newport, Mon.
"	5	Llandilo—Additions and Alterations to Council School	Carmarthenshire Education Committee.	W. D. Jenkins, M.S.A., M.R.S.I., County Education Architect, Shire Hall, Carmarthen.
"	5	Bryndu—Additions and Alterations to Council School	Ditto	Ditto.
"	5	Brynammann—Heating Apparatus and Repairs at Council School.	Ditto	Ditto.
"	5	Bettws—Repairs to Council School	Ditto	Ditto.
"	5	Hillfield—Ventilation and Folding Partitions at Council School.	Ditto	Ditto.
"	5	Castle—Ventilation, Lighting and Repairs at Council School.	Ditto	Ditto.
"	6	Manchester—School... ..	Education Committee	Education Offices, Deansgate, Manchester.
"	8	Gayton—Additions, &c.	Guardians	L. T. Eagleton, Architect, King Street, King's Lynn.
"	9	Sunderland—Customs Offices, &c.	H.M. Office of Works	Mercantile Marine Office, Sunderland.
"	9	Clutton—Alterations, &c.	Guardians	W. F. Bird, Architect, Midsomer Norton.
"	9	Bungay—School	Education Committee	A. Pells, Architect, Beccles, Suffolk.
"	11	Lancaster—Town Hall	Corporation... ..	E. W. Mountford, Architect, 17 Buckingham Street, Strand, W.C.
"	16	Bury St. Edmunds—Alterations, &c.	County Council	A. Ainsworth Hunt, County Architect, Sudbury.
ENGINEERING :				
Dec.	27	Elham—Superheater and Boiler ...	Guardians ...	R. Loneragan, Clerk, 11 Cheriton Place, Folkestone.
"	27	Salford—Reconstruction of Bridges ...	Corporation... ..	C. S. Allott & Sons, 46 Brown Street, Manchester.
"	30	Bocking—Sinking Borehole, &c.	Parish Council	E. H. Bright, Engineer, Dodds Hall, Braintree.
1906.				
Jan.	1	Bishopstoke—Bridge	County Council	W. J. Taylor, County Surveyor, The Castle, Winchester.
"	2	London, S.E.—Water-heater, &c.	Guardians	Guardians Offices, Brook Street, Kennington Road, S.E.
"	2	Widnes—Gasholder Tank... ..	Corporation... ..	J. Carr, Engineer, Widnes.
"	2	Widnes—Gasholder... ..	Corporation... ..	J. Carr, Engineer, Widnes.
"	6	Lydd—Water Tower	Water Co.	A. F. Phillips, Engineer, 38 Parliament Street, S.W.
"	9	Auckland—Wharf, &c.	Harbour Board ...	W. & A. McArthur, 150 Leadenhall Street, London, E.C.
"	10	Southsea—Pier Extension... ..	Pier Company	A. H. Bone, Engineer, 148 High Street, Portsmouth.
"	10	West Hartlepool—Reconstruction of Graving Dock	North Eastern Railway Co.	T. M. Newell, Engineer, Dock Office, Hull.
May	1	Talcahuano, Chili—Dock	—	Direccion de Material, Valparaiso.
IRON AND STEEL :				
Dec.	22	Exmouth—Main Pipes	Gas Co.	J. T. Foster, Secretary and Manager, Gas Works, Exmouth.
"	23	Manchester—Points, &c.	Tramways Committee ...	J. M. McElroy, General Manager, Tramways Dept., 55 Piccadilly, Manchester.
"	26	Slough—Pipes	Gas Co.	Manager, Gas & Coke Company, Slough.
1906.				
Jan.	4	Totnes—Fencing	Rural District Council ...	S. S. Rendle, Highway Surveyor, Hillside, Marldon Road, Paignton.
PAINTING AND PLUMBING :				
Dec.	27	Portsmouth—Decorative Works ...	Town Council	Borough Engineer, Town Hall, Portsmouth.
ROADS AND CARTAGE :				
Dec.	21	Worthing—Road Works	Corporation... ..	F. Roberts, Borough Surveyor, Worthing.
"	23	Harpenden—Street Works	Urban District Council ...	John H. Leverton, Public Hall, Harpenden, Herts.
"	27	Leigh—Making-up	Urban District Council ...	W. J. Petch, Surveyor, Council Offices, Leigh-on-Sea.
"	30	Horsham—Materials, &c.	County Council	W. McIntosh, County Surveyor, 22 Worthing Road, Horsham.
1906.				
Jan.	1	Chelmsford—Granite	Guardians	W. W. Duffield, Clerk, 95 High Street, Chelmsford.
SANITARY :				
Dec.	21	Tiverton—Sewage-disposal Works	Borough Council	J. Siddalls, Borough Engineer, Tiverton.
"	21	Redditch—Sewer	Urban District Council ...	B. Perrins, Surveyor, Council House, Redditch.
"	24	Alderley Edge—Catchpit Gulleys, &c.	Urban District Council ...	J. Newton, Son & Bayley, Engineers, 19 Cooper Street, Manchester.
"	24	Brynmenyn—Scavenging, &c.	Urban District Council ...	H. Dawkin Williams, Surveyor, Council Offices, Brynmenyn.
"	27	Hemsworth—Drainage Works	Rural District Council	T. H. Richardson, Engineer, Hemsworth.
"	29	Spondon—Scavenging	Rural District Council	J. W. Newbold, Clerk, Becket Street, Derby.
1906.				
Jan.	2	Hove—Drainage Works	Town Council	H. Hamilton Scott, Borough Surveyor, Hove.
"	4	Rishton—Sewage-disposal Works	Urban District Council ...	C. J. Lomax, Engineer, 37 Moss Street, Manchester.
"	24	Ashchurch—Sewage-disposal Works	Rural District Council ...	H. A. Badham, Clerk, Tewkesbury.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	DEPOSIT REQUIRED FOR CONDITIONS, &c.	FROM WHOM PARTICULARS MAY BE OBTAINED.
1906.				
Jan.	31	Hackney—Library	50, 30 and 20 guineas	W. A. Williams, Town Clerk, Town Hall, Hackney.
"	31	Crompton—Library	£30, £20 and £10	F. F. Gartside, Clerk, Town Hall, Shaw, near Oldham.
Feb.	15	Wrexham—Schools (W. E. Willink, Assessor) ...	£50, £30	Clerk to Education Committee, Wrexham.
Mar.	31	Birmingham—Council House Extension (Sketch Plans).	£1 is.	Town Clerk, Council House, Birmingham.

Tenders.

Criff.—For the erection of a new post-office at Criff, for the Commissioners of H.M. Works and Public Buildings:—

	Credit.
Boyd & Lonest ...	£4,553 0 0 ...
MacLeish, Morrison & Co. ...	4,500 0 0 ...
W. Ellis ...	4,352 0 0 ... £5 5 0
J. Stothard & Sons ...	4,098 0 0 ... 30 0 0
R. McRobbie ...	3,893 3 0 ...

Gloucester.—For the erection of new council schools at Derby Road, for the Education Committee. Mr. J. Fletcher Trew, M.S.A., architect, County Chambers, Gloucester:—

Bayard & Son ...	£13,659 0 0
Walters & Son, Bristol ...	13,567 0 0
J. Gurney ...	13,250 0 0
T. J. Williams ...	13,057 0 0
A. J. Dolman ...	13,054 0 0
J. Simmonds ...	13,051 8 0
W. T. Nicholls ...	12,999 0 0
W. Crane, Nottingham ...	12,975 0 0
Collins & Godfrey, Tewkesbury ...	12,923 0 0
D. Davies, Cardiff ...	12,873 0 0
Wilkins & Son, Bristol ...	12,871 10 0
W. Jones ...	12,710 0 0
E. W. Wilkes, Hereford ...	12,433 0 0
T. Cuthbert, Nottingham ...	12,350 0 0
J. E. Johnson, Leicester ...	12,240 0 0
J. G. Norman, Swindon ...	11,908 0 0

* Recommended for acceptance.

[Rest of Gloucester.]

Greenwich.—For the supply, delivery and erection of the steelwork required in connection with the second portion of the Greenwich electricity generating station, for the London County Council:—

J. Butler & Co.'s Trustees, Leeds ...	£57,897 7 7
Head, Wrightson & Co., Thornaby-on-Tees ...	54,918 6 2
Redpath, Brown & Co., Ltd., London ...	54,660 4 8
Thames Ironworks Shipbuilding and Engineering Co., Ltd., London ...	53,139 5 7
Braithwaite & Kirk, West Bromwich ...	50,275 1 10
J. Westwood & Co., Ltd., London ...	49,461 5 6
Clayton, Son & Co., Ltd., Leeds ...	47,725 11 2
E. C. & J. Keay, Ltd., Birmingham ...	46,490 7 10

* Recommended for acceptance.

Hampton.—For the erection of new schools, Percy Road, for the Middlesex Education Committee. Mr. G. E. T. Lawrence, A.R.I.B.A., architect, Adelphi, W.C.:—

Barker & Co. ...	£12,112
Ward & Son ...	11,931
Goddard & Son ...	11,829
Messum & Sons ...	11,675
Kingerlee ...	11,229
Godson & Sons ...	10,944
F. G. Minter ...	10,757
Patman & Fotheringham ...	10,728
Wisdom Brothers ...	10,609
Fassnidge, Uxbridge ...	10,518
D. Heath, Chiswick ...	10,430
C. F. Kearley, Uxbridge ...	10,385
W. J. Dickens, Ealing ...	10,294
A. & B. Hanson, Southall ...	10,253
Dorey & Co., Brentford ...	10,192
Fairhead & Son, Enfield ...	10,106
Knight & Son, Tottenham ...	9,432

* Recommended for acceptance.

Harrogate.—For the enlargement of the post office at Harrogate, for the Commissioners of H.M. Works and Public Buildings:—

	Credit.
F. Shepherd ...	£2,115 5 0 ... £22 0 0
Rudd & Son ...	2,080 0 0 ... 25 0 0
W. Nicholson & Son ...	1,889 2 8 ... 12 10 6
Oak Building Co. ...	1,817 0 0 ... 45 0 0
J. Gould, Ltd. ...	1,800 0 0 ... 8 7 6
Stott & Alcock ...	1,765 0 0 ...
W. Pearce ...	1,705 0 0 ... 25 0 0
D. Gill & Son ...	1,657 0 0 ... 13 0 0
Barker Brothers ...	1,541 6 6 ... 26 10 0

Honor Oak.—Accepted for the construction of a covered reservoir at Honor Oak, for the Metropolitan Water Board:—

J. Moran & Son, Westminster ...	£136,561
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London.—For the rebuilding of Messrs. J. T. Bull & Son's offices and scene-painting rooms, No. 134, New Kent Road, S.E. Mr. J. Halsted Waterworth, architect and surveyor, 385, Queen's Road, New Cross Gate, S.E. Quantities by Mr. W. H. Smith, Great Winchester Street, E.C.:—

Larkin & Thomas ...	£4,940
J. Barker & Co., Ltd. ...	4,489
Sims & Woods ...	4,165
W. H. Lascelles & Co. ...	4,106
W. Johnson & Co., Ltd. ...	4,100
M. Pearson ...	4,070
T. D. Leng ...	4,012
Courtney & Fairbairn ...	3,863

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T. G. Sharpington, * Machell Road Works, Nunhead, S.E. ...	£3,770
B. E. Nightingale ...	3,725
W. Sayer & Son ...	3,721
W. Wallis ...	3,639
Battley, Sons & Holness ...	3,373

* Accepted subject to variation.

London, S.W.—For the erection of the new buildings of the L.C.C. Westminster Technical Institute, Vincent Square, Westminster, for the London County Council:—

J. Barker & Co., High Street, Kensington ...	£25,680
S. E. Moss & Co., Southend-on-Sea ...	24,000
J. Shelbourne & Co., 70, Fenchurch Street ...	23,977
Spencer, Santo & Co., Ltd., Earl Street, Westminster ...	23,700
J. C. Richards & Co., Croxley Road ...	23,589
Perry & Co., Tredegar Works, Bow, E. ...	23,586
J. Mowlem & Co., Westminster ...	23,519
Prestige & Co., Grosvenor Road ...	23,175
Lawrence & Sons, City Road ...	23,126
F. & T. Thorne, Isle of Dogs, E. ...	23,000
Leslie & Co., Kensington Square, W. ...	22,977
W. Downs, Walworth Road, S.E. ...	22,968
F. & H. F. Higgs, Loughborough Junction ...	22,948
Kirk & Randall, Woolwich ...	22,898
T. G. Sharpington, Nunhead ...	22,840
H. L. Holloway, Union Works, Church Street, Deptford ...	22,800
H. Lovatt, Ltd., Darlington Street, Wolverhampton ...	22,758
Martin, Wells & Co., Ltd., 25, Auckland Street, Vauxhall ...	22,700
J. E. Johnson & Son, 61, Little College Street, Westminster ...	22,673
W. Pattison & Sons, Ltd., 49 and 50, Parliament Street ...	22,485
W. Lawrence & Son, Canal Works, Waltham Cross ...	22,478
Holloway Brothers (London), Ltd., Victoria Wharf, Belvedere Road, S.E. ...	22,370
G. E. Wallis & Sons, Broadmead Works, Maidstone ...	22,341
W. Johnson & Co., Ltd., Bellevue Road, Wandsworth Common ...	22,282
B. E. Nightingale, Albert Embankment ...	22,237
Charles Wall, Ltd., Uppernoe Road, Chelsea ...	21,975
F. G. Minter, Ferry Works, High Street, Putney ...	21,975
Kerridge & Shaw, Sturton Street, Cambridge ...	21,911
Waring White Building Co., Ltd., 1A, Cockspur Street ...	21,800
Garrett & Son, * 17, Balham Hill ...	21,490
J. & M. Patrick, Point Pleasant, Wandsworth ...	21,090
A. Hudson & Co., 30-32, Queen Anne's Chambers, Westminster ...	21,050

* Recommended for acceptance.

[Architect's estimate, £22,275.]

London, W.—For improvements to school in Latiner Road, Hammersmith for the London County Council:—

L. Whitehead & Co., Ltd., Portland Works, Clapham Road ...	£9,867 0 0
J. Simpson & Son, 48, Paddington Street ...	9,549 0 0
Galbraith Brothers, 46, Camberwell Green ...	9,077 0 9

Lathey Brothers, New Road, Battersea Park ...	£8,307 0 0
E. Triggs, 92, The Chase, Clapham ...	8,107 0 0
S. N. Soole & Son, Sheen Road, Richmond ...	7,872 0 0
Waring White Building Co., Ltd., 1A, Cockspur Street ...	7,498 0 0
Chinchen & Co., Berners Road, Kensal Green ...	7,444 0 0
W. Johnson & Co., Ltd., * Wandsworth Common ...	7,048 19 0

* Recommended for acceptance.

[Architect's (education) estimate, £6,890.]

[Architect's estimate, £48,180.]

London, S.W.—For reconstruction of the existing tramways along Vauxhall Bridge Road and the construction of tramways over the new Vauxhall Bridge:—

J. G. White & Co., Ltd., London ...	£21,809 9 6
Dick, Kerr & Co., Ltd., London ...	21,447 16 5
J. Mowlem & Co., Ltd., * London ...	20,873 0 0

* Recommended for acceptance.

[Engineer's estimate, £19,070.]

Preston-next-Wingham.—For the erection of a new Council school, to accommodate 140 children, for the Kent Education Committee. Mr. Wilfred H. Robinson, M.S.A., surveyor:—

F. & G. Foster, Norwood Junction ...	£2,654
E. J. Bowles, Ashford ...	2,625
H. Kent, Hither Green ...	2,621
A. J. Brewster, Canterbury ...	2,400
H. Lovatt, Ltd., West Kensington ...	2,380
Rowland Brothers, Horsham ...	2,339
J. H. Forwalk, Ramsgate ...	2,305
G. & H. Denne & Son, Deal ...	2,285
Hayward & Paramor, Cooling, Folkestone ...	2,259
R. Webster, Folkestone ...	2,248
L. Seager, Sittingbourne ...	2,215
Sturry Building Co., Sturry ...	2,155
W. J. Adcock, Canterbury ...	2,095
W. W. Martin, Ramsgate ...	2,071
G. Browning, Canterbury ...	2,054
A. Ovenden, Sandwich ...	2,015
Gann & Co., * Whitstable ...	1,933

* Accepted provisionally.

Taunton.—Accepted for the erection of a Council school, for the Education Committee:—

Pollard & Co., Taunton ...	£8,639
----------------------------	--------

Warrington.—For alterations and additions to Whyteleafe Council school, Upper Warrington. Messrs. A. W. Jarvis & F. A. Richards, architects, 36, Victoria Street, London, S.W.:—

C. E. Kenworthy ...	£3,719 15 9
C. Cooper ...	3,317 0 2
F. & G. Foster ...	3,143 0 0
G. Cheeseman ...	3,127 11 0
J. Quittenton ...	2,999 0 0
I. Waters & Sons ...	2,959 5 4
H. Kent ...	2,835 0 0
W. H. Hyde ...	2,756 0 0
W. Roberts ...	2,743 0 0
Marriott & Salter ...	2,650 0 0
E. Streather ...	2,577 10 0
J. Barker & Co. ...	2,556 0 0
S. Page & Son ...	2,497 0 0

York.—Accepted for the erection of asylum farm buildings. Mr. A. Creer, architect, Guildhall, York:—

R. Dent & Son, Lord Mayor's Walk ...	£1,392 10 0
--------------------------------------	-------------

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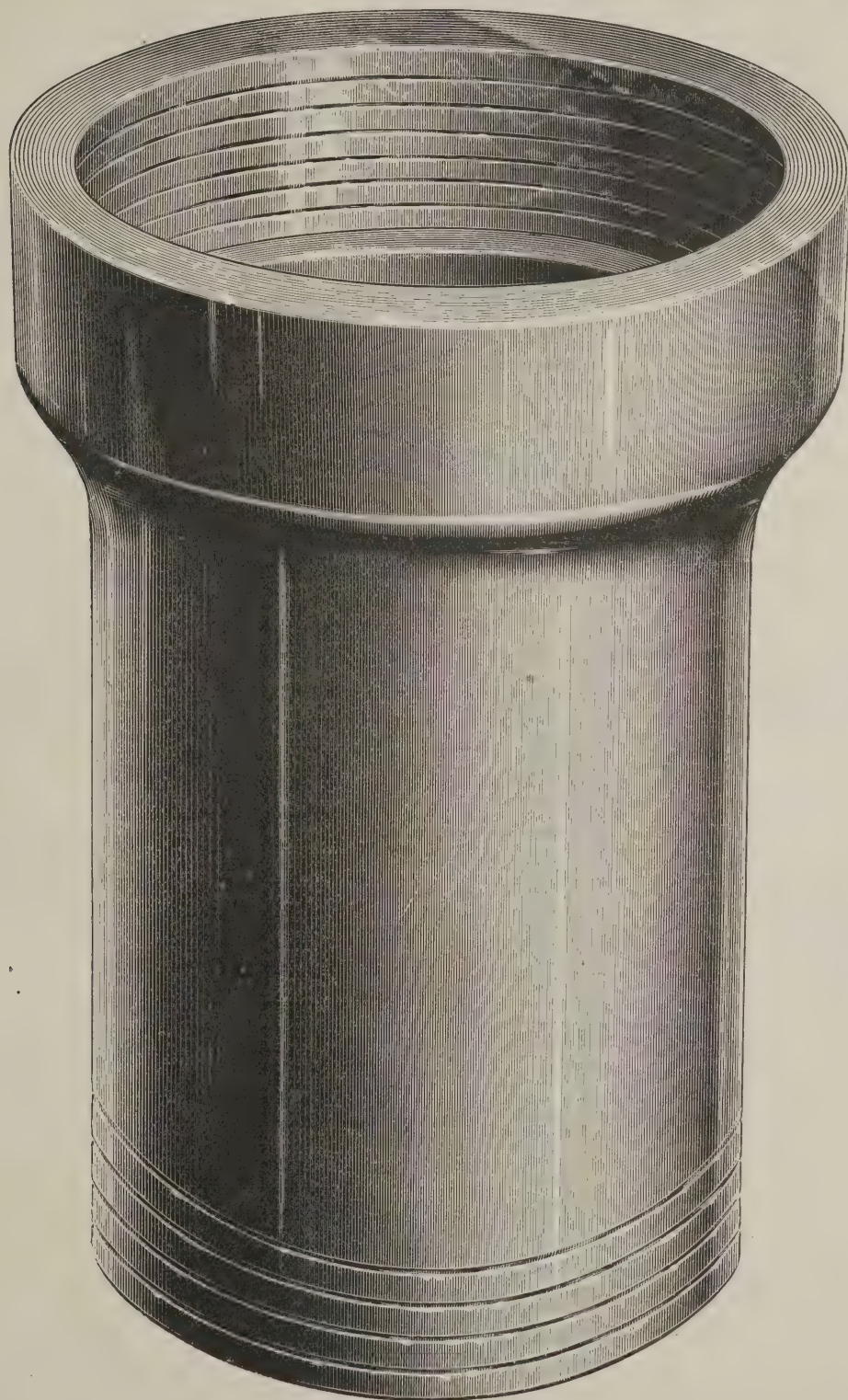
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Bankruptcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Adj.—Adjudication.]

DURING THE WEEK ending December 15th sixteen failures in the building and timber trades in England and Wales were gazetted.

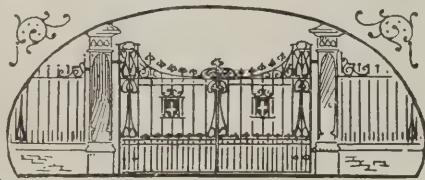
M. M. ROSS, builder, Doncaster. Deficiency £146.
T. F. CHARLES, builder, Waddingham. Deficiency £29.
A. S. BUTLER, joiner, Blackpool. R.O. Nov. 30th.
W. EATON, contractor, Liverpool. R.O. Nov. 28th.
S. VICKERS, joiner, Carlton. R.O. Nov. 28th.
M. THORBURN & SON, plasterers. Adj. Dec. 1st.
G. CAVE & BROWN, builders, &c., Bourne. R.O. Dec. 1st.
TIMSON & ADAMS, builders' merchants and contractors, Leicester. Deficiency £5,497.
E. E. CHATWIN, builder, Balsall Heath. Deficiency £107.
A. E. CLOUTMAN, builders' merchants, Bristol. Liabilities £1,067; assets £754.
HAND BROTHERS, plumber and decorator, King's Norton. Deficiency £254.
W. HOLT, builder and contractor, Cheetham. Deficiency £176.
J. W. COLLINS, builder, Portsmouth. P.E., Portsmouth C.C., Dec. 29th, at 11.
H. W. GOULD, decorator, &c., Minehead. R.O. Nov. 25th.
H. OSWIN, builder, Sutton Coldfield (late Walsall). Liabilities £580; assets £309.
J. CALLOW, builder and contractor, St. Helens. Adj. Nov. 28th.
W. MASSEY, plumber and builder, Smethwick. R.O. Nov. 28th.
A. J. GARDNER, builder, Teddington (late Twickenham). R.O. Nov. 28th.
G. W. GREGORY, builder, Sutton-in-Ashfield. Deficiency £400.
C. C. CROWE, builders' merchant, Tottenham. Unsecured creditors £1,500.
W. GARNER, builder and decorator, London. P.E., London Bankruptcy Court, Jan. 11th, at 12.
A. TWITT, decorator, &c., Abertillery. P.E., Tredegar C.C., Jan. 26th, at 10.45. Deficiency £227.
H. T. ROBERTS, architect, Rhyl. Liabilities £223; assets £190.
T. DAVIES, builder and contractor, Merthyr Tydfil. P.E., Merthyr Tydfil Town Hall, Jan. 24th, at 3.
W. URE & SON, builders and contractors, Seaton. Adj. Dec. 6th.

E. BRIGHOUSE, painter and decorator, &c., Derby. P.E., Derby C.C., Jan. 16th, at 11.
W. BUTT, builder and contractor, London. E.C. P.E., London Bankruptcy Court, Jan. 31st, at 11.30.
W. H. MORGAN, builder and contractor, Machen. Adj. Dec. 5th.
W. W. PIKE, carpenter, London. P.E., London Bankruptcy Court, Jan. 19th, at 12.
W. SHAKESPEARE, builder, Norton Canes. Adj. Dec. 7th.
A. JACKSON, builder, Walthamstow. P.E., London Bankruptcy Court, Jan. 18th, at 11.
H. SARGENT, builder, Forest Gate. P.E., London Bankruptcy Court, Jan. 23rd, at 11.30.
W. HEALD & SON, painters and paperhangers, Chorley. P.E., Bolton C.C., Jan. 10th, at 3.
G. L. SMITH, painter, Newport. P.E., Newport Town Hall, Jan. 11th, at 11.
P. RIGBY, builder and contractor, Warrington. P.E., Warrington C.C., Jan. 5th, at 11. Deficiency £1,626.
E. CORNER, joiner and builder, Bridlington. Deficiency £2,563.
J. H. MOLLETT, builder, Enfield. First meeting, London Bankruptcy Court, Dec. 22nd, at 11. P.E., same, Jan. 26th, at 12.
WOOD & CO., builder, Winchmore Hill. First meeting, 14, Bedford Row, London, W.C., Dec. 20th, at 12. P.E., Edmonton C.C., Jan. 22nd, at 11.30.
W. W. GOULD, painter and decorator, &c., Minehead. First meeting, 10 Hammet Street, Taunton, Dec. 20th, at 12.30. P.E., Guildhall, Taunton, same day, at 2.
W. GODDARD, junr., builder, Herne Hill. First meeting, London Bankruptcy Court, Dec. 20th, at 12. P.E., same, Jan. 18th, at 11.30.
W. J. WATTS, builder and contractor, London, E.C., and Worthing (late Southend) P.E., London Bankruptcy Court, Jan. 23rd, at 11.30.

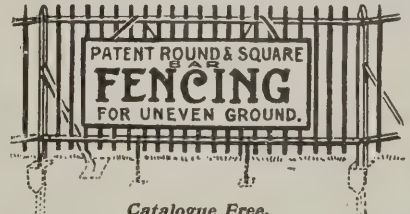
Coming Events.

Wednesday, December 20.
EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. W. Findlay on "Electric Lighting and Wiring," at 8 p.m.
SURVEYORS' INSTITUTION (Junior Meeting).—Mr. Edmund Page on "Municipal Housing Schemes," at 7 p.m.
Thursday, December 21.
CHEMICAL SOCIETY.—Ordinary Meeting at 8.30 p.m.

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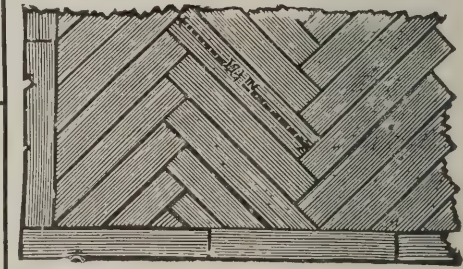


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17 1/2 x 3 x 1 1/2	6 9	6 3	9 3

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MONTHLY

FIRE SUPPLEMENT

TO THE

BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

[Number 15. December, 1905.]

NEW BUILDING LEGISLATION.

ON January 1st a considerable portion of the new Building Act Amendment Act comes into force. We would remind our readers that it is this year, 1905, that has seen the most important piece of retrospective legislation ever enacted in this country in the interests of fire-protection, and more particularly safety of life from fire. It is a sign of the times, and the increasing interest in matters of fire-protection; that this new Amendment Act should have become law; and it is a matter for congratulation for all who worked in the interests of fire-protection in the past decade that a remedy has at last been found for the worst of the evils that have resulted from thoughtlessness and negligent building of the past as far as safety of life is concerned.

The Battle to attain this Act

has been a long one. It practically dates back from the great Charity Bazaar Fire of Paris in 1897, in which so many lives were lost at a private entertainment and the eyes of all were opened to the risk to life from fire even on street-level if there is an insufficiency of exits. The lesson of the Charity Bazaar fire was accentuated by a series of conflagrations in the London City area, namely, those of Cripplegate, Barbican, &c., which showed what risks existed, although, fortunately, no loss of life occurred at any of these great fires. Then came the Queen Victoria Street fire in the very centre of the City, and the energetic proposals thereupon made by various persons and bodies calling for retrospective legislation. Thereupon came the International Fire Prevention Congress in London and the general energetic propagation in the direction of improved fire-protective enactments not only for the Metropolis but the whole country. Bills were put forward from time to time by the London County Council and the Corporation embodying the latest views of those most conversant with the subject, and, finally, the last week of the Parliamentary session just closed gave London what it has long needed in spite of the unseemly opposition of many interested parties, primarily representing the property owners.

Retrospective Legislation.

The success of the battle to attain this legislation heralds similar successes for retrospective legislation in other parts of the country—probably for the whole of the United Kingdom outside the Metropolis, now legislated for. It will probably take another decade until this retrospective legislation is universal for the United Kingdom, but it is bound to come, and such sad calamities as we have recently had at Glasgow, with its long death roll, must gradually impress even the property owner who has to meet the cost of the improvements as to the absolute necessity of safeguarding human life even if the expense involved be a heavy one.

The first stage of retrospective legislation

having been achieved as far as safety of life in London is concerned for the Metropolis, it is to be hoped that the Select Committee appointed last year will take a similar view as to what is necessary outside the Metropolis. Further, it is to be hoped that the impending proposals of the London County Council for the improvement of buildings generally may have a fair hearing at the earliest possible moment in Parliament, and that particularly those that refer to the sound and fire-resisting construction of buildings will also soon be put on the statute book.

A new Bill for 1907.

The Building Act Amendment Act as passed did not contain much that was of a fire-protective character outside the actual question of safety of life. By mutual consent the parties advocating and opposing the Building Act Amendment Bill as originally presented limited the measure to questions of escape from fire, and thus the purely structural questions were deferred. That the fire-preventive questions put forward in the last Bill will have a hearing in the Parliament in 1907 is practically certain, but that the Building Act of 1894 requires very many of the amendments, as far as construction and fire-prevention are concerned, is obvious; in fact, since the last Bill was drafted further amendments have become necessary in the direction of legislation for steel-frame buildings, for reinforced-concrete buildings, for temporary buildings of the tent type, and last, but not least, the roller shutter door which is so necessary in many factories where sliding doors are all too inconvenient.

Tardy Reform.

It is regrettable that so long and so tedious a procedure should always be necessary to attain an obvious and necessary improvement for the Metropolis where a building question is concerned, and it is, further, all too regrettable that matters of this kind should be very much made a question of party rather than being treated on their own technical merits. The Amendment Act as passed was almost endangered at the last moment by an eminent member for an Irish constituency—having no interest whatever in a London building question—opposing the passing of certain Bills merely as a protest in respect to some grievance of his own. This is not as it should be, and the sooner that the Parliamentary procedure is modified as far as technical questions are concerned the better for the community at large and the prosperity of the nation.

Sound building, safe building and fire-resisting building are questions of technical importance to the community at large, entirely outside party politics; they are economical necessities, and the sooner it is realized that such matters can well be treated in a different manner than is the case at present the better for all those interested in architecture and building. The whole procedure, too, of attaining an improved enactment is too

expensive, too complicated, and we might almost say at times too ridiculous to meet the requirements of a modern age.

Activity for the Architectural Profession.

Turning to the direct interests of architects and the building trade, we naturally see in the new enactment considerable activity in work for both. In many cases it will be possible to alter existing buildings to meet the necessary requirements of the Act, but in many also it will be more economical and more far-seeing on the part of property owners to rebuild entirely to meet the new requirements, as also those of the new era of convenience, luxury and sanitation generally. If we merely mention that every existing building exceeding 30ft. in height is affected by the Act as from January 1st; that every projecting shop where the projection exceeds 7ft. is affected; that all living-rooms over premises used as oil shops are affected; and, lastly, every existing building having more than two storeys above the ground storey—it will be realized that there will be some work to be done.

After January 1st, 1907, there will be a further requirement coming into force as to all buildings in which more than twenty people sleep, which naturally will affect the large private houses where a number of domestic servants are retained. After this date, too, all existing high buildings—i.e., buildings that have a floor 50ft. above the pavement—will be affected. This practically means that, more or less, nearly every building in London will be affected where it does not happen to be a dwelling-house of moderate size occupied by one family.

As to the provisions for new buildings, they are not of such great interest at the moment, as it is naturally a matter of course that new buildings erected should meet modern requirements. It is the retrospective clauses that are those which will be most far-reaching in effect, as far as London is concerned.

Water-supply for Fires in London.—Architects should be pleased to learn that the Metropolitan Water Board have decided that the restrictions which hitherto prevented the extra use of the London hydrant supply of high-pressure water for fire-extinguishing will be withdrawn. Architects will often have encountered the great difficulty of providing water for fire-extinguishing purposes for tall buildings such as the upper floors of hotels, flats and theatres, and all manner of ingenious devices had to be resorted to in order to obtain the necessary pressure. In future it will be possible for any one to have a hydrant pressure apparatus fitted from the Hydraulic Water Co.'s mains. We are glad to see that the Metropolitan Water Board have, by waiving the unnecessary restrictions, materially assisted in the fire-preventive policy for the tall buildings of the Metropolis, and credit is due to them and their advisors in this matter.

GLASGOW LODGING-HOUSE FIRE.

IT is with great regret that we have to record the fatal lodging-house fire that took place at Glasgow in No. 2 Lodging-house, Watson Street. It is sad that so lamentable a catastrophe should occur in any city, but it is particularly regrettable that it should have occurred in Glasgow, a city which in many directions has done much in the interests of fire-prevention and in which fire-protection received far greater attention than is the case in many other centres.

Glasgow is a municipality which has been presided over by a succession of provosts—all energetic workers and most of them particularly interested in matters of fire-prevention. The late Provost Primrose ranks high amongst these. The city has also had its municipal fire-service presided over by a sequence of highly painstaking baillies, among whom we would specially mention Baillie Cleland. And, lastly, it has had the advantage of the services of a chief officer who, in training and feeling, has always given the greatest possible importance to questions of planning and building construction from a fire point of view, and has always treated his subject on advanced lines.

Glasgow has enjoyed a Fire-Prevention Act which has brought with it material improvements, but unfortunately it has nothing of a retrospective character as yet to deal with buildings such as the lodging-house that has been the subject of this calamity or even with buildings of large cubical contents. Having regard to the interest Glasgow has always shown in matters

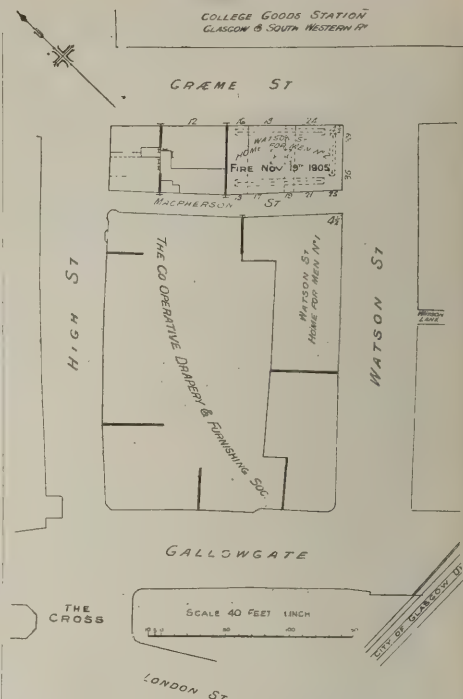
of fire-protection, it is extraordinary—and we think not quite creditable—that this question of safety from fire in lodging-houses should not have had the attention it has long called for; and if we here in these columns record a fire with a large loss of life we would immediately mention that a similar fire can at any moment occur in a similar lodging-house but a few yards away (see plan), and we have no doubt there are others of very similar construction in Glasgow.*

900 Lives at Risk.

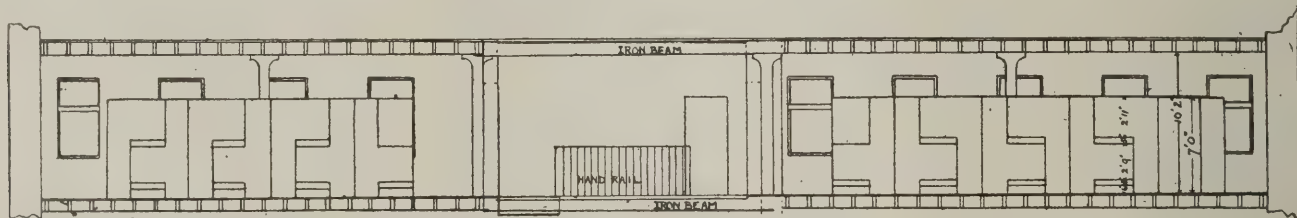
The lodging-house which was the subject of the catastrophe could hold nearly 400 occupants; the one a few doors off would hold over 500. To put it quite plainly, about 900 lives have been regularly at stake nightly in these two buildings, built on most extraordinary lines for the class of building they professed to be, and the result has been thirty-eight deaths. The only remarkable thing about the Glasgow lodging-house fire is that the deaths were not far more numerous, and, further, that such fires have not occurred earlier in the two buildings in question. It does the greatest possible credit to the Glasgow Fire Brigade and their fire-master that there should not have been a greater loss of life at this fire; in fact, we would say it is a matter of the greatest good fortune to the city of Glasgow that the list of deaths was not quadrupled. This would certainly have been the case had it not been for the energetic manner in which the fire brigade dealt with the emergency.

We publish in these columns a plan† of

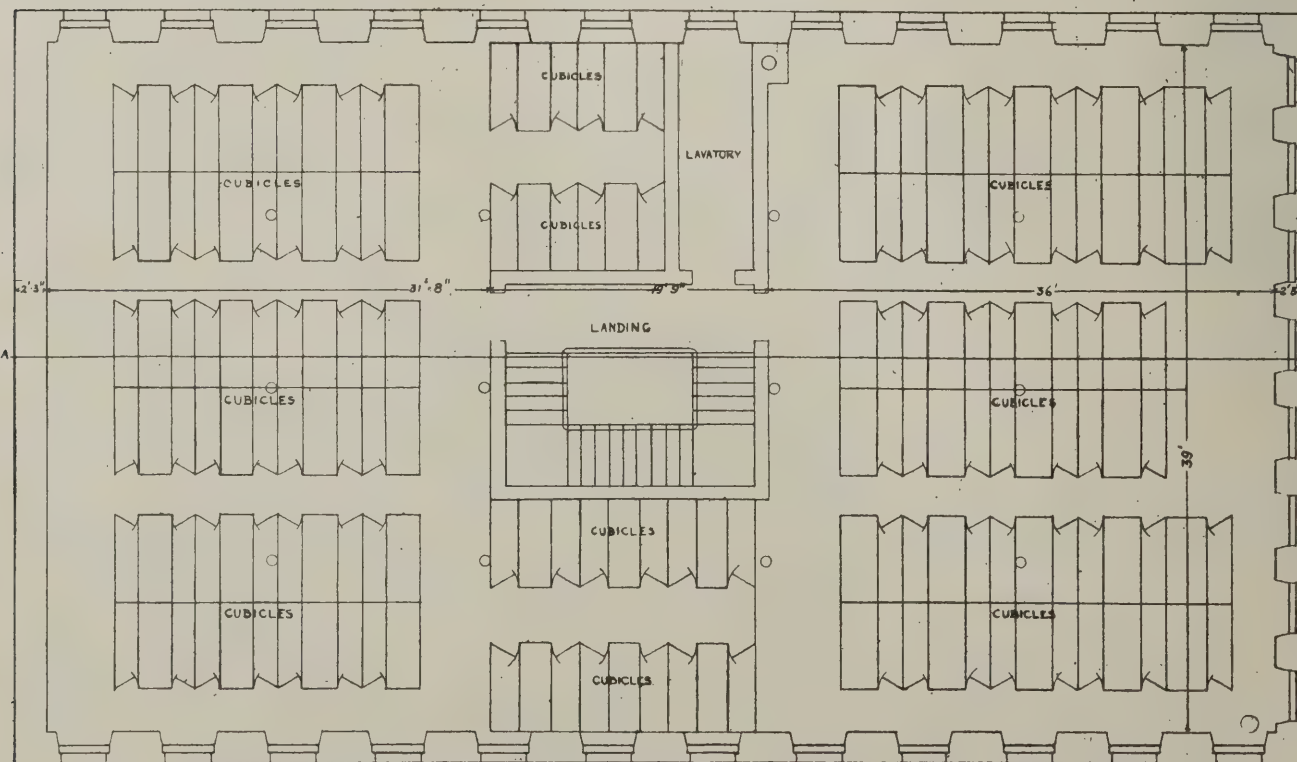
* The site plan was kindly prepared by Mr. Charles E. Goad, C.E.
† The third-floor plan has been kindly provided by Mr. Paterson.



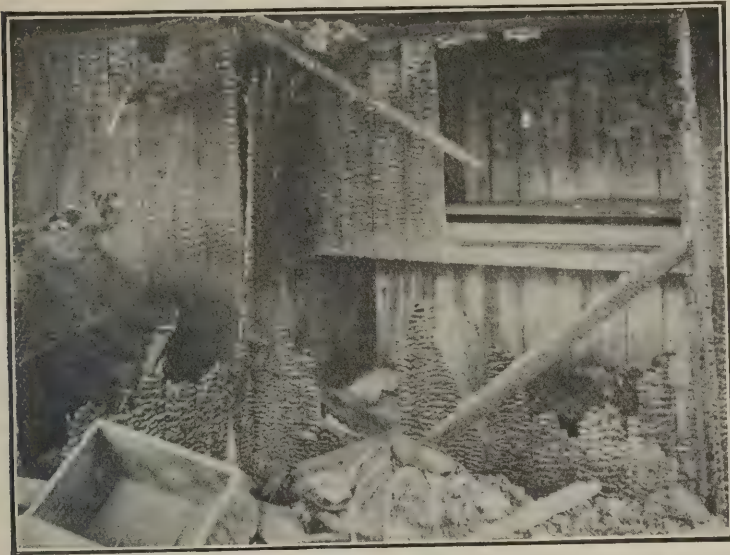
LOCATION OF THE TWO LODGING-HOUSES. the building and some photographs. The plan is one of an upper floor, namely, the third floor. We are unable to give the ground-floor plan, which, if read together with the one published, would indeed have made curious reading; for although the plan shows a large floor with a central staircase, we must try to explain that only a portion



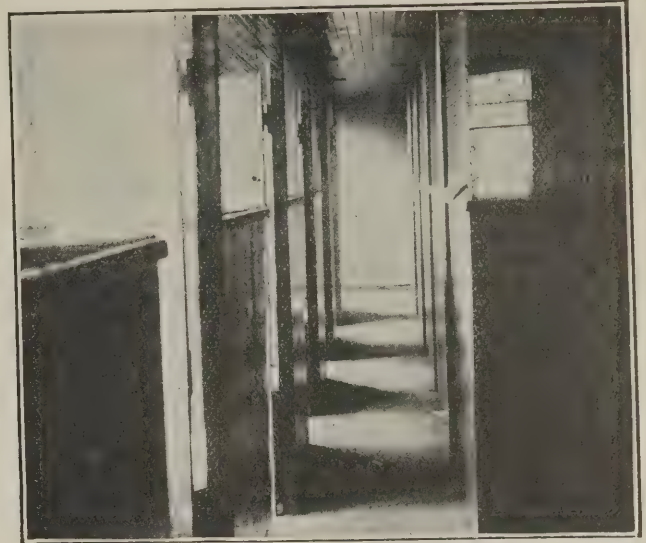
SECTION ON A. B.



NO. 2 LODGING-HOUSE, WATSON STREET, GLASGOW: PLAN AND SECTION OF THIRD FLOOR.



THIRD FLOOR.



PORTION OF ATTIC FLOOR SHOWING ARRANGEMENT OF CUBICLES.

of this floor area belongs to the lodging-house proper when you get to ground-floor level—only, in fact, that portion which faces Watson Street—the other portion being let off for a public-house and a shop (see site plan). So we see that, apart from a lodging-house risk, there is a very considerable risk of two other independent occupants.

The Sole Approach

from this portion of the ground floor to the upper storeys was by means of a single flight of stone stairs leading to the staircase proper, shown on plan, and here we would immediately mention a point which has apparently not been given quite the attention it deserves, namely, that at this staircase there was an iron gate, used for the purpose of locking up the lodgers. This iron gate was actually locked at the time of the outbreak of the fire, and had it not been for the presence of one of the attendants housed in a room near by, and who attended to this gate and unlocked it when there was already a crowd of struggling men trying to get down the stairs and through this gate, there would have been one of the most terrible holocausts that Europe has ever seen.

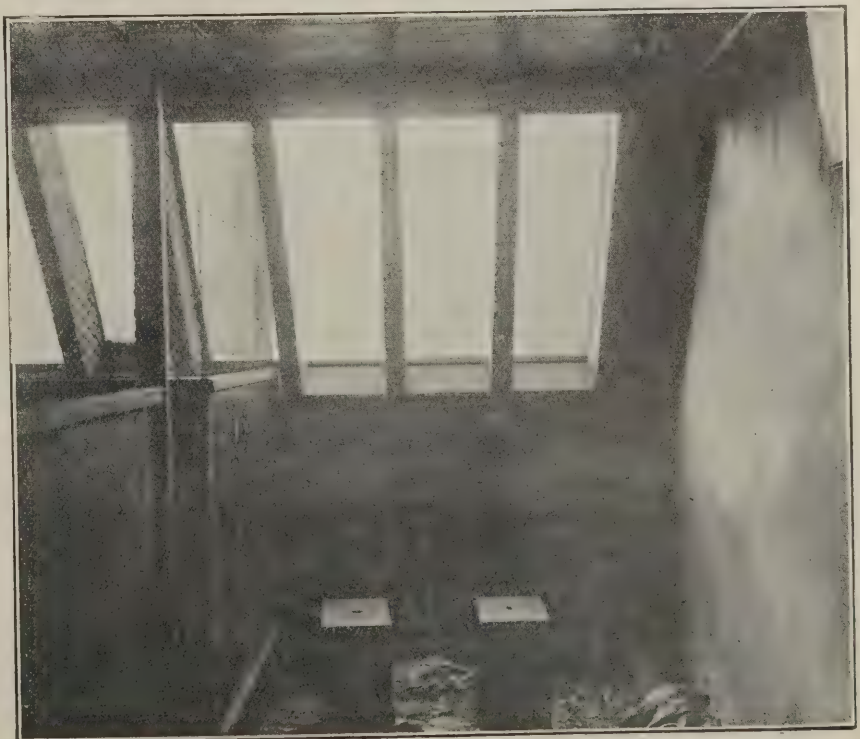
The building which faced Watson Street, from which thoroughfare it had its main entrance, was a building comprising a basement, a ground floor, a third floor and an attic floor under a Mansard roof. The floors from floor to ceiling were respectively of the following heights, namely:—Ground floor, 14ft.; first floor, 13ft.; second floor, 12ft.; third floor, 10ft.; attic floor, 8ft. On one side of the building there was a thoroughfare; on the other side an alley. Thus on three sides it faced the open. The total dimensions of the building were about 50ft. frontage to 50ft. depth. From this depth, however, quite half must be deducted from the ground floor as being utilized in other occupancy for the public-house and shop referred to above.

The Ground Floor

was only used for an eating hall and recreation-room. On the first floor, part of the area was used as a recreation-room. The beds, which were on all floors except the ground floor, were arranged cubicle fashion, hit and miss, as indicated on the section illustrated. Each cubicle had its own separate entrance, and could be bolted from the inside by the occupants. The walls of the cubicle did not reach up to the ceiling, a foot or two being left for air-space, and this space was filled with wire-netting. The whole of the cubicle construction was simply of matchboarding; the ceilings were lined with matchboarding; the matchboarding was varnished. Generally speaking, it would be difficult to arrange anything more inflammable than this.



THIRD FLOOR, IN WHICH FIRE ORIGINATED AND WAS CONFINED.



UPPER OR ATTIC FLOOR SHOWING MANSARD ROOF.

On the Night of the Fire

the warder apparently had a room on the first floor. The cubicles were fairly well filled on the night in question, and the house was closed about 11 p.m. The alarm was raised about 5 a.m. in the morning, when the inmates naturally bolted for the staircase, which they found closed at the bottom by the iron gates referred to, and it was this that had to be released by the warder, who had access to them from a small side staircase, not shown on plan, leading from the landing to the first-floor recreation-room.

As to the actual outbreak of fire, the cause has not yet been definitely ascertained, but it resulted in a general stampede, and for such a stampede the exit accommodation was quite insufficient, there only being the one central stone staircase and no special arrangement of emergency exits of any description whatever—not even an emergency exit on to the roof.

There is one lesson perhaps that should be learnt, and that is that there is a great dislike on the part of some lodgers in houses of this kind to turn out of their cubicles. In some cases they consider they are being hoaxed by an alarm of fire with the view that the confusion created would facilitate thieving. On the other hand, there is also a dislike on their part to leave their clothes and possessions in the cubicle, which are generally their very all. The peculiarities of the inhabitants of different classes of dwellings must also be taken into consideration when such habitations are being designed.

The absence of additional staircases naturally also hamper very considerably the work of the fire brigade, as such additional staircases are not only means of exit but of assistance to the brigade's work.

The photographs explain themselves and tell the sad tale. The lesson of the fire is, of course, obvious, but the sooner it is generally appreciated the better.

COMMON LODGING-HOUSES IN LONDON.

ARISING out of the Glasgow fire, the question has naturally been raised how London is provided for in the case of an emergency in one of these buildings, and we therefore publish an extract from the Proceedings of the London County Council in which the Public Health Committee reported upon the matter to the full Council. The extract will clearly show the position and the trouble that is being taken in the Metropolis to improve what was some few years ago a disgraceful state of affairs:—

"In the administration of the law relating to common lodging-houses in London we were impressed some years ago by the danger to the lodgers in the event of a fire breaking out at some of the premises, and this was one of the considerations which led us to recommend the Council to apply to Parliament for authority to require that no house should be used as a common lodging-house unless the keeper obtained annually a licence from the Council for that purpose. . . .

"By the London County Council (General Powers) Act, 1902 (Part IX.), the Council obtained the legislation necessary for the purpose. . . .

"The Council delegated to us the exercise of the licensing powers conferred upon it by the Act, and we have during the last three years dealt with all the common lodging-houses in London as regards the means of escape in case of fire, and the works which the Council has considered necessary have in nearly all cases now been completed. In the preparation of these requirements the architect and the chief officer of the London Fire Brigade have made inspections of the houses, and have advised us thereon. There are at the present time 281 houses accommo-

dating 24,511 men, 44 houses accommodating 2,303 women and 13 houses with accommodation for 310 married couples. . . .

Not easy to deal with.

"It has not been easy in dealing with houses of the class in question to devise means of escape which, while reasonably sufficient for the purpose, could be carried out without involving prohibitive expense. We have given every consideration to any alternative proposals or suggestions made by the keepers of the houses, and we recognize with satisfaction the efforts which the great majority of the keepers have made to carry out the required works. Our general practice has been to insist upon an alternative means of escape in case of fire being provided from rooms licensed for lodgers, and this has necessitated the construction of new staircases in a number of the larger houses and of external balconies and step ladders in others. In several instances it has been possible to obtain the alternative means of escape by making openings between adjoining houses. In cases in which the provision of means of escape by the roof has been allowed, we have required guard-rails to be fixed. Other requirements have had relation to the protection of staircases when necessary, the re-hanging of exit doors so as to open by pressure from the inside, the removal of inflammable material stored in dangerous positions, notices as to the position of exits and nearest fire-alarms, the provision of fire-extinguishing appliances, and the lighting throughout the night of means of exit. In dealing with houses accommodating women, we have especially felt it necessary to secure that the alternative means of escape shall be readily accessible and such as women would have no difficulty in using. . . .

"We shall, of course, take steps to ensure that the means of escape and the fire-extinguishing appliances provided at the houses shall be kept in good condition and efficient working order, and a by-law which requires this is included in the series recently made by the Council."

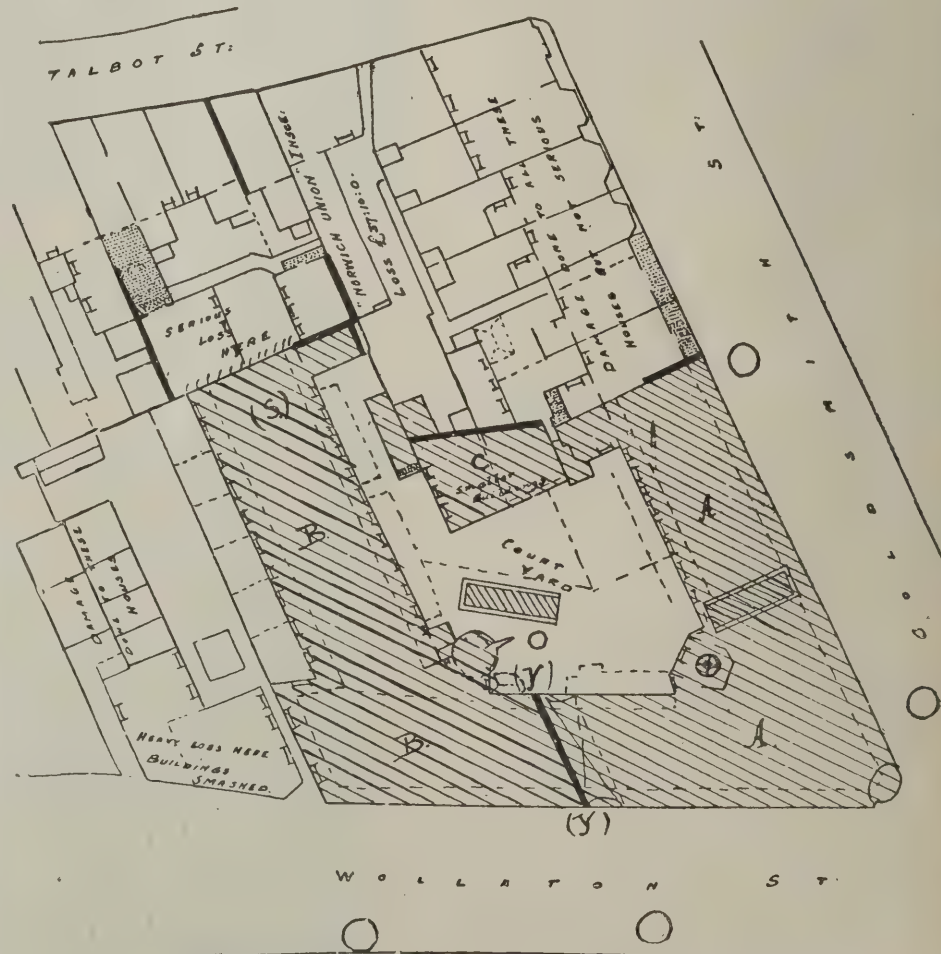
The By-law for Common Lodging-houses in London is as follows:—

"Every keeper shall keep and maintain in good condition and repair and in efficient working order all means provided for the escape of the inmates of the common lodging-house in case of fire. The keeper shall cause fire-extinguishing appliances which shall be reasonably sufficient to be kept constantly charged and available for use on each floor of the common lodging-house.

"The keeper shall not use or suffer or permit to be used in any part of a common lodging-house into which lodgers are received any lighted candle or any lamp supplied with paraffin, mineral or other oil or spirit for lighting, heating or cooking purposes, unless such candle is properly protected or such lamp is so constructed, protected and secured as not to involve risk of fire to the house or its contents.

"Every keeper shall cause all gas-burners in a common lodging-house to be protected where necessary by glass or wire globes, and shall also cause all gas-burners within 3ft. of an inflammable ceiling in any such house to be fitted with consumers to distribute the heat.

"The keeper shall not store or keep, or allow to be stored or kept, any paraffin, mineral or other oil or spirit or matches or any explosive substance in any cupboard or other space situate under any staircase in a common lodging-house."



PLAN OF THE WHITEHALL FACTORY FIRE, NOTTINGHAM.

THE NOTTINGHAM FACTORY FIRE.

BY the courtesy of the editor of the "Norwich Union Magazine" we are enabled to publish a plan and small photograph of the great fire at Whitehall's Factory, Nottingham, and also by the courtesy of the editor of the "Sprinkler Bulletin" a large photograph of this fire.

The fire was one of considerable importance, and regrettable, inasmuch as the actual loss in cash values is estimated at between £50,000 and £70,000, while some 300 or 400



RUINS OF THE NOTTINGHAM FIRE.

workpeople were thrown out of employment for a considerable period. The factory was originally constructed as a lace factory, but was afterwards adapted for various industries, i.e., let out in parts, one part being used as a motor works. It is said that there was no petrol in the building, but such statements must be taken with a grain of salt. The local brigade was called to the fire at 5 o'clock a.m., but owing to the faulty construction and planning and the general inflammability of the contents, it was obvious that the loss would be a total one from the outset.

As to the fire insurance aspect of a fire of this kind, it is very interesting to read in the "Norwich Union Magazine" that the following is the insurance object-lesson. The insurance contributor of that journal writes:—

"(1) We shall have seen that in an 'omnibus risk' of this kind we must be prepared for a serious loss and possibly for the complete destruction of the whole of the premises;

"(2) That party-walls where there are lantern attics on both sides must not be regarded as altogether creating a separation of risk; and

"(3) That there is the additional danger to be feared that in order to keep matters quiet the fire brigade may not be summoned until after efforts have been made by the caretaker or others to extinguish the fire.

"How then, it will probably be asked, should we treat insurance proposals on this class of risk?"

"To this I would say—

"(1) That before issuing a policy we should be satisfied that the landlords have exercised proper care in the selection of their tenants, and, if possible, we should also by inspection ascertain for ourselves that such tenants are desirable and eligible for insurance;

"(2) That the maximum rating current for the risk should be obtained;

"(3) that in fixing the retention the whole of the premises should be regarded as at one risk; and

"(4) That a condition should appear in the policy to the effect that on a fire being discovered by the assured or any of his employees notice should be instantly given (by telephone if possible) to the chief fire-brigade station."

FIRE TESTS WITH A MODEL THEATRE.

AT the instance of the Society of Civil Engineers and Surveyors of Vienna some extensive tests have been undertaken in consultation with specialists interested in theatre protection from all parts of Europe. The Local Government Board and Municipality assisted in these experiments in every possible way, and the invitations issued to participate in them and to co-operate in the conference on the experiment were issued by the Government Department, and the President of the Local Government Board presided on both tests and consultations.

The tests took place in a model theatre specially erected by voluntary contributions, the local authority subscribing £500. The model theatre was one-third full size—or, to be exact, the erection of the stage and the auditorium was to one-third full-size, exclusive of corridors and the like. This model theatre was to be tested with a view of giving facilities for studying the effect of an outbreak of fire under five different conditions, and above all to indicate the effect of the proper ventilation of a stage, and the effect of the lowering of the fire-resisting curtain combined with ventilation. The theatre

had been erected from designs of a well-known firm of Austrian theatre architects, Messrs. Felner & Helmer, and the tests were conducted by a sub-committee of the society named above in the presence of the various public officials interested and of the representatives of foreign societies and bodies participating in the work.

The result of the tests, which took place on November 22nd, will be officially reported upon in due course, as also the result of the conference of the local sub-committee and visitors; but in the meantime we are able to give the following preliminary report, which will give some idea of the nature of the building under test, the arrangements of the tests, and their effect. It is pleasant to record the great interest taken by the local authorities in these testing operations, and the way they assisted in them, both actively and financially, whilst actually undertaken by a sub-committee of a private professional association. And it is also pleasant to know that the visitors who attended in Vienna were most hospitably received by the mayor and other local officials, and entertained both on the day of the tests and the following day of the conference.

Particulars of the Building.

The stage was 6 m. deep, 7'50 m. wide and 6 m. high to the grid-iron level. The proscenium opening was 3'35 m. wide by 2'60 in height. The adjoining auditorium,



THE WHITEHALL FACTORY FIRE, NOTTINGHAM.

designed as a one-tier house, had a width of 5'50 m., a depth of 7 m. and a height of 4'25 m. The auditorium was provided with a ventilation opening on the ceiling and the stage with a central ventilation outlet, and also four ventilators in the four corners. The back part of the auditorium had polished wire-glass windows to enable a good view of the tests to be obtained.

First Test.

(Disadvantageous conditions).—With no safety curtain and no stage ventilators working. All ventilators on the stage closed. Ventilator in the auditorium half-open. Cloth curtain down. Gas, candle and oil emergency lamps alight. Electric emergency lights in use.

Fire started on stage. When a small door was opened on the side of the stage the fire flamed up and broke through the curtain with considerable force. The curtain was drawn into the auditorium. Gravel strewed on the auditorium floor was scattered far and forced into the open through the exits which were blown open (outwards).

The emergency gas, candle and oil lights, all went out, and the emergency electric lamps could not be seen owing to smoke.

The temperature on the stage had reached 400 degs. C.

Second Test.

(The working of the iron fire-resisting curtain under unfavourable conditions.) All ventilators on the stage closed. Ventilator in the auditorium half-open. No cloth curtain down. The iron curtain is let down after the starting of the fire. Lights as before.

Fire started. The fire beat into the auditorium in strong flames, and on the letting down of the iron curtain the flames passed below it (long-pointed flames). When the iron curtain was fully down it was possible to enter the auditorium. The smoke in the auditorium was quickly drawn off through the ventilator. All emergency lights had gone out excepting the electric emergency light.

Third Test.

(Working of the stage ventilators without fire-resisting curtain.) All ventilators on the stage are opened after the fire started. Ventilator in the auditorium closed. Curtains remain up. Lights as before.

Fire started. The fire burnt quietly. It was at first possible to remain in the auditorium, but eventually this became impossible. The smoke was drawn off from the stage through stage ventilators. All emergency lights remained burning.

Fourth Test.

(Working of the stage ventilators with the iron fire-resisting curtain—favourable condition.) The ventilators on the stage are opened during the progress of the fire (partly automatically, partly by hand). The iron curtain is let down after the fire has broken out. Ventilator in the auditorium remains closed. Lights as before.

Fire started. Smoke was drawn off through the stage ventilators. The air in the auditorium is only slightly vitiated, and it is possible to remain in the auditorium. All emergency lights remained alight.

Fifth Test.

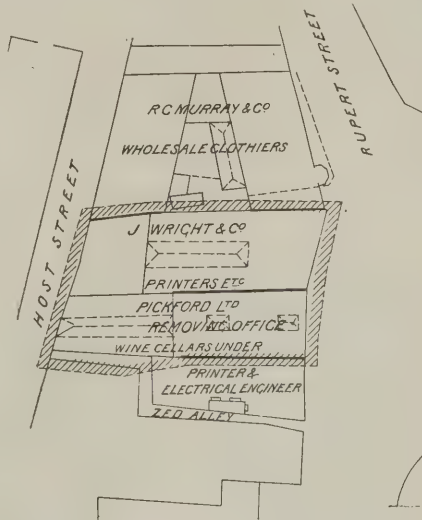
(Working of the stage ventilators in conjunction with a sprinkler installation.) The ventilators on the stage opened during the fire. The ventilator in the auditorium kept closed. No curtain lowered. A sprinkler installation on the stage brought into operation. Lights as before.

Fire started. Smoke was drawn off through the opened ventilators. After a short time the sprinkler installation began to operate and the fire was extinguished. It was possible to remain in the auditorium. The emergency lighting remained alight.

THE BRISTOL FIRES.

THE two fires at Bristol which were recorded in a previous "Fire Supplement" have raised a considerable commotion in that city as to the necessity of fully applying the existing regulations as to the separation of buildings. In each case it will be remembered that the fire spread from one building to another, and that the money values lost in the buildings affected were in both cases materially in excess of those of the buildings in which the fires originated.

As it happens, Bristol is, as a matter of fact, equipped with excellent regulations, but it would almost appear that the American principle has been adopted of having excellent regulations on paper but forgetting their application. It is of course one of the common features of all modern American cities to have most model local by-laws on fire-preventive questions, but it is equally



THE SITE OF THE COLSTON AVENUE FIRE, BRISTOL.

certain, speaking generally, that with quite few exceptions these regulations are to a very great extent merely ornamental, i.e., they are not properly applied.

Bristol has the great merit of already having suitable regulations since 1840 and 1847, which are published in the "By-laws relating to Streets and Buildings for the City of Bristol," issued in 1903. It is in fact quite remarkable that such excellent regulations already existed as far back as 1840 and 1847, and this makes it more remarkable that they were not acted upon.

In section 25 (1840) it is quite plainly stated "that all openings in party-walls must be provided with iron doors and frames surrounded with stone-door cases into which the iron frames are inserted"; in section 24 (1847), "Every wall between separate buildings is a party-wall"; in another, "Every party-wall is to be of the thickness required for the largest building."

Again in another it is required "that where a building is divided into two or more separate buildings, proper party-walls are to be erected between the several parts." This presents a retrospective clause. In another section "separate buildings are such as are in separate occupation and have separate entrances and separate staircases."

There cannot be the slightest doubt about it that the buildings affected by fire should have had thorough separation by well-built party-walls. If Bristol had a Fire Inquest Act such as we have in the area of the Corporation of the City of London it should have been most valuable for showing where the fault lies. In a matter of this kind we cannot imagine that the fault is merely that of apathy; the Bristol fire hazards are surely too great for that with its growing business.

We give a plan of the second Bristol fire, in which the buildings showed an absence of proper separation as required by existing regulations. This plan and the one published in the previous supplement are valuable evidence of how regulations are at times neglected.

LONDON FIRE INQUESTS.

THE utility of the Fire Inquests Act for the area of the City of London has been recently frequently proved by the inquests held under the presidency of Dr. Waldo; and although the findings of the juries impannelled for enquiries of this description are sometimes a little curious, there cannot be the slightest doubt that the general tendency of the inquests is most valuable in calling attention to public dangers and strengthening the hands of those who wish to find a remedy.

We are recording in short the result of an enquiry into a petroleum fire on a city thoroughfare which raised a very difficult problem, namely, the protection of the basement of buildings having areas or gratings through which running spirit may set light to the contents. The state of the law on this question of petroleum cartage in London is certainly still very unsatisfactory, and requires remedy whilst such powers as already exist should be better applied.

As to the other fire, which the jury put down to an electrical cause, we think that it might be more judicious for juries not to jump too easily to conclusions as to crediting electricity with the cause of fires when there are other possibilities as to the cause forthcoming. The general trend at the present moment is to attribute too many of the unknown causes of fire to electrical errors or accidents. Whilst, of course, electrical wiring opens up innumerable sources of danger, more particularly if faultily done, it should always be remembered that, speaking generally, it takes very bad wiring to cause fire, assuming there is no special cause, such as the malicious tampering or ignorant handling of the wires or the application of an unexpected amount of power.

The reports on these inquests as presented to the London County Council read as follows:—

The Cornhill Fire.

"We desire to draw attention to a fire which occurred in Cornhill shortly after six o'clock on the evening of 16th October, 1905, on a steam motor wagon carrying cans of petrol. It appears that there were about 900 two-gallon cans, of which from ninety to hundred were full or nearly full. The remainder were returned empties, but there may have been some petrol in them. The flames rose to a height of from 20ft. to 25ft. above the level of the roadway, and the buildings on one side of the street were slightly damaged. If the fire had occurred in a narrow thoroughfare the buildings on either side would without doubt have become involved, and possibly a large fire might have resulted.

"An inquest into the cause of the fire was held on 27th October, 1905, by the City Coroner under the City of London Fire Inquests Acts, 1880 and 1885, when the jury returned a verdict to the effect that they were of opinion that the fire was caused by spirit leaking from a can or cans contained in the wagon coming in contact with an improper lamp. The jury added a rider to the effect that they considered that the carriage of petroleum through the streets should be regulated by the Petroleum Acts, or that an amendment of the law should be sought for the purpose.

"We have informed the Public Control Committee of the circumstances, and have

asked them to consider whether regulations could not be made to govern the conveyance of highly inflammable liquids such as petrol, and to provide that the vessels and vehicles in which such liquids are carried shall be suitable for the purpose."

The 49, Queen Victoria Street Fire.

"On 10th November, 1905, an inquest was held under the City of London Fire Inquests Act, 1888, by the City Coroner into the cause of a fire which occurred at No. 49, Queen Victoria Street, E.C., on 5th November, 1905, when the jury returned a verdict to the effect that the fire broke out in the basement of the building and was probably caused by a defective electric circuit. The jury expressed the opinion that the means of escape in case of fire were totally inadequate, and they recommended that the following improvements should be made, viz.:—(1) That all electrical wires throughout the building should be encased in metal tubing; (2) that the lift should be encased in fire-resisting material; (3) that a strong iron railing should be placed outside the building along the parapet; (4) that iron escape ladders should be fixed; and (5) that an additional staircase should be provided to serve the other end of the building.

FIRE TESTS.

CONCRETE AGGREGATES TEST.

WE have already referred to the important concrete aggregates test undertaken by the British Fire Prevention Committee in October, and we now have the official report before us. This report adds considerable information to what we have already indicated informally, and we give herewith full particulars as to the aggregates used and a summary of the results in each case.

The test, as already reported, was a three-hour one, followed by the application of water, the temperature exceeding 1,800 degs. Fahr. According to a prefatory note by Mr. Max Clarke, F.R.I.B.A., the test indicates, in short, that Thames ballast concrete is quite unreliable for ordinary floor work that is intended to be fire-resisting.

It is to be hoped that these tests will be continued at the earliest opportunity, as they have not yet gone far enough, but naturally the programme of tests with work in common use is a question of money, for such investigations are as expensive as they are time-taking. Had it not been for the co-operation of the Associated Portland Cement Manufacturers, Ltd., even the tests as far as they have gone would have been impossible to arrange.

The Bays.

The seven bays or slabs of concrete (10ft. by 2ft. 7ins. in the clear) were 4½ins. thick, and were quite separate.

The Cement.

The cement used was Portland, supplied by the Associated Portland Cement Manufacturers (1900), Ltd., London, and described by them as "Ferrocrete," used as a trade name for this particular brand of cement.

The particulars supplied by the makers contain the following statement:—

(a) Very fine grinding—residue on sieve with 32,400 meshes per sq. in. not exceeding 14 per cent.

(b) Great and progressive tensile strength averaging on the inch section:—

	7 days.	28 days.
Neat cement test	550 lbs.	750 lbs.
Sand test	200 "	350 "
1 (3 sand to 1 cement.)		

(c) Maximum of expansion—not exceeding 2 m.m. under the Chatelier test.

Preparation of the Aggregates.

In each case the aggregate was turned both in its dry and wet condition, and the concrete to form each slab laid on the centering in a rather wet state. 1½ gallons of water were used for each cub. ft. of concrete, approximately 20 per cent. of water by volume.

Summary and Results.

In the following description the aggregates are given to 1 part by volume of the above cement in each case:—

(1) FURNACE SLAG CONCRETE. Bay No. 1. Blast-furnace slag from the Islip Ironworks, Thrapston, Northampton, broken to pass a 1½in. ring, 3 parts. Clean pit sand from Kent, 2 parts.

RESULT.—Top: Slab cracked across in two places. Underside: Curved downwards ¼in.; slight cracks visible.

(2) BROKEN BRICK CONCRETE. Bay No. 2. Broken brick to pass a 1½in. ring, 3 parts. Clean pit sand from Kent, 2 parts.

RESULT.—Top: Slab cracked across in three places; slight curve downwards. Underside: Curved downwards ¼in.; slight cracks visible.

(3) BROKEN GRANITE CONCRETE. Bay No. 3. Broken granite, ¾in. (Guernsey granite chips), 3 parts. Clean pit sand from Kent, 2 parts.

RESULT.—Top: Slab cracked across in three places; curved downwards about ½in. Underside: Curved downwards ½in.; no cracks visible; about 1in. washed off by water.

(4) BURNT BALLAST CONCRETE. Bay No. 4. Burnt ballast, viz., clay from the neighbourhood of Child's Hill, burnt with slack coal, broken to pass a 1½in. ring, 5 parts.

RESULT.—Top: No cracks; not curved downwards. Underside: Not curved downwards; no cracks visible; about 3ins. washed off underside (in parts) by water.

(5) COKE-BREEZE CONCRETE. Bay No. 5. Coke breeze broken to pass a 1½in. ring (free

from fine dust), from the retorts of a London gas company, 5 parts.

RESULT.—Top: No cracks; not curved downwards. Underside: Not curved; no cracks visible; about 1in. washed off underside (in parts) by water.

(6) CLINKER CONCRETE. Bay No. 6. Furnace clinker, viz., the raking from the furnaces of large boilers, broken as last, 3 parts. Clean pit sand from Kent, 2 parts.

RESULT.—Top: Slab cracked across in two places; curved downwards about ¾in. Underside: Not curved; one slight crack visible; pitted in places about 1in. deep by water.

(7) THAMES BALLAST CONCRETE. Bay No. 7. Thames ballast dredged from the River Thames to pass a 1½in. ring, 3 parts. Clean pit sand from Kent, 2 parts.

RESULT.—Top: Slab cracked across in very many places; curved downwards about 2ins. Underside: Curved downwards 1½in., and bad cracks all over in all directions, mainly longitudinally; much washed off by water.

IMPENDING FIRE TESTS.

It is announced that in continuation of the series of fire tests which are being conducted with concrete and reinforced concrete as applied to building construction, three further investigations are to take place having special bearing on the question of aggregates. These will be—(a) with a floor of clinker concrete supported by broad flange beams, the reinforcing joists being fitted without the use of cleats, rivets or bolts, and the soffit of the beams being protected by coke-breeze concrete on expanded metal lathing; (b) with a floor of broken brick concrete reinforced with expanded metal, and supported by ordinary steel joists encased with a similar concrete on expanded metal lathing; (c) with a floor of clinker concrete reinforced by rods (on the Coignet



THE THAMES BALLAST CONCRETE BAY (NO. 7) AFTER TEST (SEEN FROM BELOW).



THE MUNICH CENTRAL FIRE-STATION.

system) and supported by reinforced clinker-concrete beams.

The tests will be in 22ft. testing chambers, each floor being divided into three bays, and in each case British "Ferrocete" cement will be used. The conditions of the test will be those for the standard of "full protection" (Class B.), which necessitates a fire test of four hours, increasing to over 1,800 degs. Fahr., followed directly by five minutes of water from a steam fire-engine, the floors being loaded $2\frac{1}{2}$ cwts per ft. super.

The first-named test is a repetition of one of August last, in which Thames ballast concrete with ordinary cement was used, with the result that some of the panels between the reinforcing joists collapsed. The third test, with the Coignet floor, is a repetition of the $2\frac{1}{2}$ hours test in which the standard of full protection (Class A.) has already been obtained, but with the additional protection of the rods as required by the new fire-insurance rules for reinforced-concrete systems.

Fires on District Railway.—On the evening of November 26th the brigade was called to the West Brompton station of the District Railway, where the underside of an electric railway carriage was found to be alight. The fire was mainly extinguished by means of sand, water being also used after the electric current was cut off.

THE NEW MUNICH CENTRAL FIRE-STATION.

THE new Munich Central Fire-station, which serves as headquarters for both the professional and the volunteer fire service of that city, is a conspicuous building in one of the best thoroughfares of Munich. The building also contains offices for the fire-survey departments of that city, inasmuch as the whole fire-preventive and fire-extinguishing service are under the charge of the chief surveyor of Munich, who thus really has two departments under him, namely, that of fire-inspection work and that of the fire brigade proper. The station is extremely roomy, and is, as a matter of fact, of a much more elaborate and expensive character than is customary with the headquarters stations of the most prosperous of cities.

In illustrating this fire-station it is perhaps of interest to give a few particulars as to the fire-preventive control in Munich. The principles adopted are as follows:—

Plans for all buildings in Munich have to be approved by this department. The building owner may appeal to the Bavarian Home Office if he has a grievance, and finally he may also appeal to the Minister of Interior in person if not fully satisfied. The principal officers of the fire brigade have to pass qualifying examinations in building construction and act as fire surveyors.

There is an elaborate code of building regulations in Munich, but many of these regulations only lay down guiding principles, leaving the officials considerable discretionary powers. The Munich regulations allow the officials of the building control and fire-survey departments to enter any building at will, and make requisitions for further safety from fire both from the building point of view and that of their general management, against which requisitions there is a power of appeal as described above. Chimneys are compelled to be swept periodically by public chimney sweeps at a tariff charge, and the chimney sweep is held responsible if a chimney in his district remains unswept. An inquest is held on fires if thought necessary, irrespective as to whether there has been loss of life or not. Dangerous structures are dealt with promptly by a trap fitted with appliances and materials being always ready for horsing and despatch from the station like an ordinary fire-brigade appliance (see "Fire Supplement" No. 1).

A SEASONABLE HINT.

ARCHITECTS who are in the constant employ of large works and the owners and managers of large industrial undertakings would do well at this season to remember that however excellent the fire installation may be with which the buildings in which they are interested are equipped there is a liability for the water-supply to freeze, and the absence of water in the early stages of fire may mean the entire gutting of the premises involved. We therefore publish the following extract from a circular issued by one of the American mutual insurance corporations who have the interest of both their corporation and the insured at heart:—

- (a) Examine tanks and all pipes, fittings and valves, whether for steam heating, general water service or fire-protection. See that none are frozen or have been frozen, and that they are all in operative condition, and where there is any liability of freezing arrange the necessary protection.
- (b) See that all valves are open that should be open, and try water outlets to ascertain if all pipes are free and ready for service.
- (c) See that extra sprinklers are on hand in case of need to replace frozen or melted heads.
- (d) Be sure that your engineer is fully posted as to the purpose and intention of every valve and pipe.
- (e) Try your pumps and see that they are in proper working order.
- (f) Test all the hydrants, and see that they drain properly.
- (g) Instruct the night watchman thoroughly in the use of all fire apparatus and the operation of all valves.
- (h) We take this occasion to call your attention to the liability of freezing water in casks and pails in cold buildings, and suggest that you take measures of prevention, at the same time avoiding danger of water damage.

It will be observed that apart from the actual hints having special bearing on the effect of cold weather on fire apparatus, some of these hints are very useful in a general way.

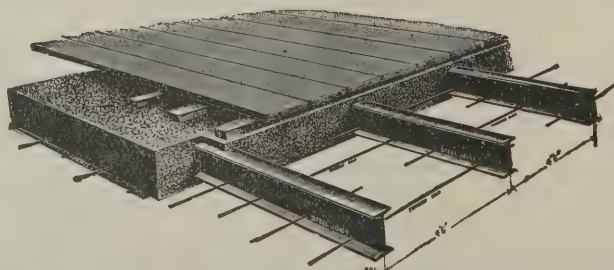
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THE BUILDERS' JOURNAL AND ARCHITECTURAL RECORD.

December 27, 1905. Vol. 22, No. 568.

6, Great New Street, Fetter Lane, E.C.

*To our readers at home and abroad—A
Happy and Prosperous New Year.*

Summary.

The second volume of the "Architects' Law Reports and Review" has just been published. All the important decisions affecting the profession during the year are fully dealt with and illustrated, while the London Building Acts (Amendment) Act is included, with some useful legal notes on the same. (Page 365.)

The January elections at the Royal Academy will be in many ways the most interesting that have taken place for many years. (Page 365.)

A notable new school has been erected at Small Heath, Birmingham, to the designs of Messrs. Buckland & Farmer. The exterior is the expression of the interior arrangement, and is unusual by reason of the construction of barrel roofs in breeze-concrete covered with asphalt (thus reducing the cost of maintenance to a minimum) and the provision of central halls with side lights instead of roof lights, so as to improve the internal appearance of the halls. (Page 366.)

To ascertain approximately the artificial lighting required in factory buildings, divide the area of the floor by 70 and multiply by 20, which equals the number of sperm candles (six to the lb., and burning 120 grains to the hour). (Page 362.)

In dealing with the architectural development of cities in a paper read before the Leeds Philosophical Society, Prof. Beresford Pite said there were a few instances at home that would repay attention like those at Liverpool around St. George's Hall, and at Cardiff, in the Bute Park, where the new municipal buildings, law courts, university and museum were being grouped on a grand scale in harmony with the picturesque adjoining castle. (Page 366.)

"Architecture and Journalism."

There is a good deal to interest the general reader in the pamphlet with this title which has just been issued from these offices. It gives a very interesting account of the inception, development and character of our four journals—THE BUILDERS' JOURNAL, THE ARCHITECTURAL REVIEW, SPECIFICATION and THE MUNICIPAL ENGINEERS' SPECIFICATION—and is illustrated by many photographs showing the premises, the type-setting and machine rooms, the publishing office and the blockmaking studios. We shall be pleased to send copies to any readers who care to apply.

Co-operative Heating, Hot- Water and Gas.

MANY aspects of the cheap cottage problem have been dealt with, but there is one suggestion we have not seen put forward—one which could effect not only some economy but give additional convenience and comfort to the working classes. This is in the provision of heat, hot-water and light from some common centre. This principle of co-operative supply has already been carried out in regard to water and drainage in connection with many country cottages where large estate proprietors own the entire property, a condition which is to be found in very many cases. The only instance of the supply of hot-water in this way that we have heard of in this country is at Kells, near Whitehaven, where the Earl of Lonsdale is erecting a group of thirty-two miners' cottages. Hot-water for domestic and bathing purposes will be supplied to all the houses from one boiler; and as the ordinary Cumberland cottage is unprovided with a hot-water boiler, the arrangement will doubtless be most welcome to the occupants. It is apparent, moreover, that economy of fuel is thus achieved. Considering how inefficient the ordinary open fire is for heating purposes, we think the system might be extended to provide hot-water radiators. It could easily be arranged for these to be turned off if not desired by the inhabitants without affecting the supply of hot water for domestic use. As regards bedrooms, small coils could be provided so that the rooms could be warmed in winter. The importance of this, from a health point of view, is obvious. A range would of course be necessary for cooking purposes, but this might be a gas-stove. Of recent years the small power-gas producers have come into favour for gas-engines, and although these are principally used for pumping water, wood sawing and other estate purposes, there is no reason why they could not be utilized to provide a gas-supply for lighting and cooking for a group of labourers' cottages. If the gas were charged for according to the quantity registered by meter, waste could be avoided; and there seems no reason why a small charge for hot water could not be made also on a meter record of the quantity used. There are also many circumstances where this system might be adopted in towns, such as improvement areas under municipal authorities and large blocks of workmen's dwellings.

The Quantity Surveyor's Function.

In a paper read before a recent meeting of the Quantity Surveyors' Association Mr. F. B. Hollis defined the quantity surveyor as a man having expert knowledge (1) of building construction in all its varied phases; (2) of the mode of measurements customary in trades, together with the value; (3) of building by-laws and regulations; (4) of architecture sufficient to enable him to describe the details accurately; (5) of sanitary regulations, laws of dilapidations, arbitrations, compensation, rights of light and air, and mortgage, &c.; and (6) possessing a comprehensive grasp of the nature of the work to be done, which should enable him to place before the builder bills of the exact quantities of all materials and labour required. We think this list is a fairly accurate one, comprising what various quantity surveyors have been called upon to do, and it shows the usefulness of this class of specialist. Architectural work is nowadays so various and so complicated that specialism is necessary, and we must not be surprised if still further classes arise. Mr. Hollis went on to deal with such questions as whether the bill of quantities should form part of the contract, as to whether the quantity surveyor should write specifications for architects, and the conditions of contract, points which, although the quantity surveyor has to deal with and upon which he is often called upon to give a decision, yet are somewhat outside his province as a specialist. Mr. Hollis drew attention to the fact that owners do not favour the system of estimating at present adopted in the building trades, because they cannot ascertain from the start exactly how much the job is likely to cost. This undoubtedly is a defect, and in the United States, where builders take off the quantities themselves from much more completely finished drawings, a lump sum can be given with some reasonable likelihood of its being exact. This inaccuracy of any estimate is one of the great causes of dissension, and it is a pity that some solution cannot be arrived at, although the system of including the quantities as part of the contract may satisfy the builder if it does not satisfy the client. However reasonable it may seem, it probably will not suffice. We have already stated that we think the architect ought to control the specification as a necessary part of the design, yet a busy man can no doubt delegate some of his duties to a quantity surveyor.

FACTORY BUILDINGS.

Their Planning and Construction.

By A. ALBAN H. SCOTT, F.I.S.E., M.S.A.

(Concluded from p. 350, No. 567.)

Power-house.

THE power-house should be close to the boiler-house, with easy access between the two. The lighting and power switch-boards should be kept separate, and both placed on a gallery at the end of the power-house.

Electric travelling or hand cranes should be arranged for, so as to permit the removal of any heavy machinery without the necessity of erecting derricks, which is a very costly item; also, provision should be made for any machinery proposed to be fixed to allow the free outlet of same without unnecessarily cutting the building about. This could be arranged for at the gable end by either having large sliding doors to be opened in case of necessity, or by building up thin brickwork with straight joints so that it could be taken down and rebuilt without injuring the other portion of the building.

The shafting being hung on to or suspended from the main stanchions or girders, it is of the utmost importance that good foundations should be given to the principal points of bearings. If the shafting once gets out of alignment through unequal settlement in the building, it is an everlasting trouble to remedy this.

Chimney Shafts.

Steel chimneys have been used a great deal in recent times, probably because of the short time required for their erection, but they are very little cheaper than brick chimneys, and the cost of annual maintenance is so great that it outweighs any other advantages they seem to offer. Round chimney shafts are more economical and of a smaller area than square ones, and the effect of the wind upon them is much less. Tall chimneys should not be connected to any other building, owing to the increased settlement due to their height. The size and height of a chimney entirely depends upon the work it is required to perform.

Construction of Walls and Partitions.

The walls and partitions can be constructed of brickwork, concrete, Uralite or corrugated iron, or they may consist chiefly of glazing, or a combination of any of these materials to suit the circumstances of each case. The internal facing of brickwork should have flat joints, so that if it is whitewashed or painted the wall presents a fairly even surface without unnecessary small ledges for the retention of dust. All brickwork should be built in old English bond. Brick piers carrying heavy loads or subjected to vibration should be constructed in cement-mortar. All arches, abutments, oversailing courses, half-brick partitions, trimmer arches and parapets should also be in cement. It is usual to allow 1 in. to every 30 ft. in height of brick walls or piers for settlement of the mortar joints; this is important where a girder gets its bearing at one end on brickwork and rests at the other end on a steel stanchion. Where large masses of walling or gable ends are being constructed on a site exposed to powerful winds they should be carefully shored. A case came under my notice some months ago where a new wall in an exposed situation was shored only on the windward side, which resulted in the wall being gradually levered over by the shore itself, as after every gust of wind the wall was prevented from regaining the perpendicular by the shore taking a new bearing as the wall gave to each gust of wind. All salient angles of brickwork should be of bull-nosed blue bricks for a height of 7 ft. Hoop-iron bond may be found very serviceable if used judiciously.

Wire screens should be used for separating portions of shops for any special kind of work

and for stores. These are far preferable to solid partitions, as they give freer circulation of air and solve to a great extent the question of light. Fixing bricks should be provided for the purpose of fixing joinery work, and no wood should be built into the walls. All lintels should be formed of reinforced concrete.

For the damp-proof course, asphalt is the best for vertical work, but for horizontal work the best form is vitrified stoneware slabs. No artificial asphalt should be used for horizontal work. The best mineral asphalt only should be used.

Glass.

Generally, no glass should be less than $\frac{1}{4}$ in. thick, the rough-cast glass being the best owing to it being more easily cleaned than ribbed glass. The roof lights should be wire-weave glass, to prevent the danger of broken glass falling. This wire-weave glass has special fire-resisting qualities, and should be used in all places where light is required which might form connecting points for the spread of fire, such as in panels of doors to staircases and lift enclosures. In Glasgow and other northern cities about one-half the area of walls and roofs is composed of glass, whereas in the south only about half this quantity is generally used. The lower panes of glass should not be totally obscured, as this is very depressing for the employees. Rough-cast glass is sufficiently obscured, and yet from the inside you can just see objects outside, which relieves the monotony. When galleries are used the roofing lights will require to be near the ridge of the roof, so that ample light will be thrown down the well-hole. Where there are no galleries the roofing light is more effective if placed midway between the ridge and eaves.

Window Frames.

Window frames should be of steel, and the panes should be kept of small size, so that in case of breakage the cost is small to replace. The opening portions should be opened by gearing with detachable key; no lines and cords or pulleys should ever be used. The detached key should be in the keeping of the person in charge of the shop.

The internal sill of windows should not be left flat, but sloped off to prevent a large accumulation of dust, &c., and externally to prevent accumulation of snow and wet.

Joinery.

All joinery used should be of the best description, both as to material and workmanship. Very strong and hard wood should be used for doors, window frames, enclosures, &c.; in the case of large doors they should be well held together by iron bands at all angles, and at their weakest joints. The locks and ironmongery generally should be of the simplest possible description, with stout and strong fastenings; and, generally speaking, no cast-iron should be used for door or window furniture. In the case of sliding doors flush drop-handles should be used.

Sliding Doors.

Sliding doors should invariably be used (swing doors are always a trouble); they should be hung at the top with anti-friction runners, the running bar being in one piece and stout, so that there is no risk of deflection. The guide-rail should be at the bottom with a narrow opening, formed of two angle-irons, properly spaced apart with distance-pieces and bolts. These should be bedded firmly in concrete and finished flush with the floor line. In the case of external doors, the top runners and bars should be protected from the weather by a small projection over same.

The doors may be formed of corrugated iron on a steel framing of angle bars, or of wood; the latter are generally more satisfactory. Very excellent doors are those formed of two, three or four thicknesses of wood and Uralite, and faced with polished

tin plates. They are eminently satisfactory, especially as internal doors, being automatically shut after a certain temperature is acquired; they are also fire-resisting.

Floors.

Floors (except ground floors) should be either constructed of wood flooring in the ordinary way or be fire-resisting floors, of which there are very many varieties. This matter, however, is dealt with under the heading of "Reinforced Concrete." Great care should be taken in using precautions to prevent any chance of floors, whilst under excessive heat, expanding and pushing out the enclosing walls. This also might be caused by using bad cement. The simplest and best method of avoiding this disaster is to insert fillets of wood around the concrete flooring next the walls whilst it is being laid, and afterwards, when the concrete has partly set, to remove these. The necessity of attending to such points as these will probably be better realized when I state that a short time ago a concrete floor forced the side walls of a building out of the upright to the extent of 5 ins. merely by expansion under heat.

Flooring.

Various flooring is used, according to the nature of work to be carried on. If wood is required, maple will be found inexpensive and of excellent wear, provided the wood is in narrow widths and well secured. Good deal, with the surface as left from the saw, is also extensively used, as well as wood blocks like those used for street paving. Maple should not be less than $\frac{1}{4}$ ins. thick, deals not less than $\frac{1}{4}$ ins. thick, and wood blocks 3 ins. If in wood flooring the battens are embedded in the concrete they should be of dovetail shape and well tarred, as also should be the underside of the boards. It will sometimes be found necessary to put a damp-proof course of asphalt under the whole floor. This additional expense should not be incurred unless absolutely necessary, and can be obviated in many cases by putting about 9 ins. of hard bricks broken, well rammed under the concrete. There are many pavings which can be laid *in situ* or in slabs. Generally that laid *in situ* is better, owing to the liability when the slabs are not properly bedded to crack in case of heavy weights.

Where stone or other paving of cold nature is used the employees are generally provided with standing boards, formed of battens, similar to ordinary snow boards. Unless these are made in a particular form they may be dangerous for use close to machinery or tanks, as they are liable to slip on a greasy floor. In certain factories the flooring is made of slabs of checkered iron plates similar to the gangways of an engine-house. I think these must prove dangerous. There is a patent flooring which is made up of cement and sawdust. It is clean, warm, tough and non-slipping.

Roofs

should be constructed of wood or steel, or a combination of these two materials. It is not usually found successful to use anything but steel for roof-work, owing to the fact of the shrinkage of wood; moreover steelwork is very much lighter and does not obstruct the light to any great extent, so that no heavy shadows are cast upon the machinery or plant; and there is also an economy in maintenance. The covering to pitched roofs can be formed of a variety of materials, such as tiles, slates, Uralite, corrugated galvanized iron, glazing, &c. Tiles and slates are expensive; Uralite requires constant painting; corrugated galvanized iron should be coated with a wash of Portland-cement grout, and the glazed portions should be formed of glass glazed into patent steel bars with drawn lead covering, thus getting over the objection of using putty. The corrugated galvanized iron

sometimes causes a certain amount of condensation; this is avoided by lining the underside of the roof with Uralite or Compo-boards, and painting. No wood rafters should be used for any coverings to factory buildings; steel laths can be used without a great additional expense. Provision should be made for clips and bearers to support snow boards, &c., and to enable the roof glazing to be cleaned down. The pitch of the roof also requires to be carefully worked out, or the result will be unsatisfactory.

Plaster

should never be used in the actual factories and workshops. It is a continual source of trouble and expense for repairs, and never satisfactory. If it is necessary to have a smoother surface, then either Uralite sheeting or Compo-boards should be used, both of which can be fixed to almost any materials; they are also fire-resisting, and can be painted or coloured; the cost of fixing is very small, and the work can be executed very quickly.

Paintwork.

With reference to the general paintwork, we must be content to regard this as merely a means of protecting the materials, and not as a form of decoration, but there is no reason why a cheerful scheme of colouring should not be adopted. It costs no more, and has an appreciable effect on the spirits of the workpeople. The scheme of colouring should be uniform throughout, which is possibly less expensive than patched work, with different colours and shades for every building, and far more satisfactory. For internal work everything above the level of 6ft. above floor line should be white; below this point a fairly dark red colour is found to be very effective and serviceable. The external work can be best treated with a combination of two colours, such as dark green for all doors and a lighter green for window frames and other ironwork.

Drainage.

Under the Public Health Act every building used as a workshop or manufactory must be provided with suitable and sufficient accommodation in the way of sanitary conveniences, having regard to the number of persons employed and with separate accommodation for persons of each sex, and it is for the surveyor to see that this is complied with. All rainwater drains should run into collecting tanks fitted with an efficient filter. The water can then be utilized for the purposes of supplying the works. The yard gully and soil drains should be connected to the main sewer, or, where this is not available, into a cesspool placed at a good distance from the factory. A small installation of septic tanks may be provided on a suitable site where it is possible to discharge the effluent. The gulleys should all have movable locked covers or grids with proper curbs around them. Where rainwater is to be collected, gulleys should not be used.

In certain factories it is necessary to run the drains from the yard gulleys, &c., into a tank to collect oil and other material for re-use, thus doing away with any waste, and if this were not done trouble would probably arise with the sewer authorities for allowing trade refuse to discharge into the sewers. All eaves gutters should be of galvanized wrought-iron secured to galvanized brackets, and so fixed as to prevent tilting when ladders are placed against them. Cast-iron down-pipes should never be used; they should be of galvanized iron, and these should be fixed by brackets so that the rainwater pipe is at least 2ins. away from the building.

Ventilation.

The cubical capacity can be considerably increased in a steel building at a very small additional cost, a building 18ft. high being only a trifle more expensive than a building 12ft. high. This will be a great help towards the avoidance of excessive heat in summer

when corrugated iron roofs are used; whereas the extra cost incurred in increasing the cubical contents of a brick building is a very serious item. Fresh-air inlets can be provided at any points desired, and the outlets can be arranged to suit the special requirements of each building. Continuous louvres can be used at the apex of the roof, or individual louvres may be placed at certain points; these should be fitted with shutters to open and close with a very simple apparatus.

Men at work vitiate much more air than men at rest. 55 cub. ft. of air per head per minute is required for good ventilation. An additional amount should be allowed for all gas jets, &c. Where either heat or loose steam accumulates, special ventilators have been designed to suit special cases. Care should be taken that the large amount of glazing on the roof does not cause a draught. All louvres and ventilators should be so designed as to prevent any rain from being driven into the building. In such buildings as cotton, wool, flour or other similar mills, special arrangements need to be made. Also in certain shops small open fires are used, and in this case arrangements have to be made to collect the smoke in special flues to obviate the expense and the nuisance of the large number of small chimneys. Louvres should be arranged to throw coal dust, flour, &c., away from gutters, as otherwise these will speedily become choked.

Lighting and Heating.

I cannot do more than just touch upon the question of artificial lighting and heating. To ascertain approximately the lighting required, divide the area of the floor by 70 and multiply by 20, which equals the number of sperm candles (six to the lb., and burning 120 grains to the hour). The following are a few of the methods adopted for lighting:—Electric light (various methods). Coal gas—Incandescent, acetylene. Oil—Kitson's and other methods.

The light should be thrown downwards on to the work, and protection for the eyes provided as much as possible.

Heating can be effected in many ways, namely, radiators—electric and hot water (high- and low-pressure); steam (high- and low-pressure); hot air; and gas. Dowson's gas is also sometimes used for heating, &c. The temperature found most suitable is 50 degs. to 55 degs. Fahr., but in special cases, such as cotton and wool mills, a greater heat is required. It entirely depends upon the nature of the work carried on as to which system should be adopted. The large pipes required in the low-pressure hot-water system are a great disadvantage, taking up a large floor area unless they are in a trench, which again is open to objection.

Lightning Conductors.

These should not be fixed haphazard, but a proper scheme should be formulated for the whole of the works. The tall chimney should have a copper band around the top, and stout copper points, each about 1ft. long, at intervals of about 30ins. around the circumference, and the rod should be connected with all bands and other metal in or near the chimney. Oxidation of the joints must be carefully guarded against. The rod should be attached to the building by metal clips, and not insulated; these clips should not be so tightly fixed as to pinch the rod, or to prevent contraction and expansion. The lower extremity of the conductor must be buried in permanently damp soil, and the tape soldered to a sheet of copper having an area of about 10ft., this sheet being not less than $\frac{1}{16}$ in. thick.

Reinforced Concrete.

For reinforced concrete construction there are at present about fifty different systems, most of which are patented in some detail of construction, the principle in all systems

being similar. The by-laws of the United Kingdom will not allow economic building with reinforced concrete, but on the Continent matters are quite different, and in many cases special by-laws have been framed to deal with reinforced concrete construction, while in other cases this is allowed to be carried out subject to the approval of the proper authorities. The necessity of the English local authorities framing by-laws acknowledging and governing the construction of reinforced concrete buildings is becoming every day more urgent.

The best materials only should be used. They should be well and carefully mixed and properly rammed. If the ramming is not properly carried out there is a chance of rust getting to the steel by the air percolating through the perforations in the concrete.

Iron rods bedded in concrete have been found submerged in water for 400 years without rust. The remarkable fact in this connection is that iron already rusty when embedded in concrete becomes perfectly clean, and when taken out will resist rust even more than clean iron.

The proportions of the ingredients for the cement practically follow the usual practice. The cement for the concrete should be Portland cement from well-burnt clinker; it should be finely ground, and 80 per cent. should pass through at least a 100-mesh. It should weigh from 100 lbs. to 120 lbs. per struck bushel; that is, it should be both fine and heavy. It should be a grey or greenish-grey; other colours denote imperfections. Its tensile strength should be equal to 380 lbs. per sq. in. seven days after being made; there should be no appreciable swelling or shrinking. The best cement for the purpose, and one that answers to the above description, is that manufactured by the Associated Portland Manufacturers, Ltd., which they name, rather vaguely perhaps, "Ferrocrete." The advantages claimed for this cement are as follows:—The clinkers are hand-picked, which ensures well-burnt clinker only being used. This prevents excessive expansion. The cement is reduced to such fineness by grinding that only 14 per cent. remains after passing through a sieve with 32,000 meshes per sq. in. It is of great tensile strength, averaging from 550 lbs. to 750 lbs. per sq. in. for the neat cement, according to the period it remains after being made up. The concrete should consist of 3 of cement to 5 of river sand and 10 of ballast or broken brick or granite; that is a proportion of 1 to 5. Clinker should never be used, as it is impossible to govern its components; a certain amount of sulphur is always present, which may finally disintegrate or at least affect the setting of the concrete. The sand should be from the river, clean and sharp. The concrete should be mixed in small quantities on a raised platform, and watered gently and moderately, and turned over three times dry and three times wet. The reinforcement consists of round bars of steel varying in diameter from $\frac{1}{4}$ in. to 2ins. All wirework should be annealed.

The weight of reinforced concrete varies from 140 lbs. to 160 lbs. per ft. cube.

Strengths.

For the purposes of reinforced concrete work the following strengths of the various materials are generally accepted:—The ultimate resistance of concrete to crushing is 25 tons per sq. ft. Its ultimate tensile strength is about 5 tons, but this is rarely taken into consideration. The ultimate tensile strength of steel is taken at 30 tons per sq. in., the safe working load being one-fourth of this. The modulus of elasticity of mild steel is 30,000,000 lbs. per sq. in., and its elastic limit is reached at 8 tons to the sq. in. The steel should be of a mild quality, so that the bars can be twisted to any shape without cracking, and should bend whilst cold to an angle of 180 degs. Another

great advantage of reinforced concrete is that it fails slowly, and gives pronounced warning of being over stressed before failing. Failure does not occur until the elastic limit has been passed; reinforced concrete beams have more of the characteristic of steel than of ordinary concrete beams. They deflect and recover. If highly elastic steel is used it should be bonded to the concrete. The strength varies as the strength of the bars; about 10 per cent. metal is a good proportion; this equals in weight 120 lbs. per cubic yd. of concrete. A special test made in Calais showed that after a reinforced concrete beam of arched shape was stressed till it cracked, 86 per cent. more weight was put upon it before it broke. Brickwork will fail with only 59 per cent. over the weight required to crack it. A beam was tested with eight and a half times its calculated breaking weight before it cracked in the centre. Since that time, six and a half years ago, the load has not been removed, and the beams show no further deflection and no increase in the size of the cracks.

That reinforced concrete can resist shocks and vibrations is instanced by the fact that piles are made with this material and give the very best results after being driven in the usual way, namely, by means of a falling weight. With regard to the effect of vibration, it may be stated that this is not of such importance as it would be in a steel construction, the reinforced concrete having been proved to vibrate only in a very small degree; this makes it invaluable for use in boiler and engine beds. Hollow walls, where desired, may be easily constructed, although I am not prepared to recommend the use of hollow walls in any material. Double floors, for greater security against fire, and to check the transmission of sound, &c., can also be economically and strongly built.

Advantages of Reinforced Concrete Construction.

The following are some of the points which go towards economy:—Ease and rapidity of erection; painting is not required; thicknesses of walls and floors are reduced everywhere; cost of maintenance, nil; cost is in nearly all cases less than the ordinary mode of building, and it can be said that as time goes on reinforced concrete increases in strength rather than deteriorates. With regard to painting, this may seem a small item, but to take an instance I may cite that the Forth Bridge, a steel structure, is always in the hands of the painters, which probably costs £600 to £1,000 annually. This would be avoided in the case of a reinforced concrete bridge.

Reinforced concrete is proof against boring animals and insects. I may instance that Baker Street Station, originally built of wood, when pulled down was found to be literally alive with fleas. Concrete is proof against marine worms, which have been known to destroy wood piles at the rate of 1 in. to 3 ins. per annum. There is a saving of more than 20 per cent. over steel in the cost of stanchions, and 15 to 25 per cent. in beams. Floors in reinforced concrete are lighter than ordinary fire-resisting floors. For piers, abutments, vaults, floors, walls, &c., reinforced concrete has about from three to five times less volume than ordinary concrete or brickwork, and therefore less weight. In retaining walls less thickness is necessary. The thinness of walls means increased air space and accommodation.

Foundation Rafts.

If building on soft ground we should endeavour to spread the weight of our building over a large area in order to get a good bearing. A reinforced concrete beam or slab can be constructed, say, 4 ft. wide, and this, owing to the reinforcement, need not be more than 4 ins. or 5 ins. thick. This slab in section is like an inverted T, the wall resting on the beam portion. The slab, being built up of interlaced steel bars, is practically monolithic,

and consequently very rigid, and owing to the small thickness very economical. Single slabs are used to spread the weight of piers or detached stanchions, and they are tied together in such a way that it is impossible for the column to get out of the perpendicular, however eccentrically it be loaded. The whole site in cases where the soil is liable to contain soft spots, such as marsh land, can be covered with a homogeneous slab, thus ensuring equal settlement. The weight of roof principals and floors can be concentrated on piers, which will allow the walls to be constructed only a few inches thick, and as they are tied into the piers they do not suffer from unequal settlement, as brick or stone walls built on the same principle would.

Flooring

can be made in several ways. First, thin slabs only 3 ins. or 4 ins. thick, supported by small beams or ribs spaced only a few feet apart, and resting on the main beams or walls. This method is used principally for mills, warehouses, and generally where the superloads are considerable or where the spans between the supports are unusually large. These small beams are not generally hidden by a ceiling; in certain cases, however, a ceiling is provided either in reinforced concrete or other material, and supported by the beams, leaving a space between them and the slab; secondly, thicker slabs can be made, 5 ins. to 6 ins. thick, with a reinforcement of principal bars, say, $\frac{1}{2}$ in. to $\frac{3}{4}$ in., running in the direction of the smallest span between supports and bearing; the secondary bars are about $\frac{1}{4}$ in. thick spaced every 4 ins. or 5 ins.; thirdly, when a floor without ribs is required, and when the span and load are both considerable, in order to diminish the thickness of concrete in compression a network is introduced in the upper part of the slab, the bars of which take the compressional stress. These two frameworks are connected by $\frac{1}{4}$ in. ties. This flooring is on the principle of a beam of great width compared to its depth. The principal and secondary bars are bound together by annealed wire $\frac{1}{8}$ in. diameter at every other intersection.

Beams.

For beams the reinforcement consists of two or more upper bars (compression) and two or more lower bars (tension) linked together by $\frac{1}{4}$ in. ties, and spaced every 4 ins. or 5 ins. The ties binding these upper and lower bars are bent with special tools, and each set can be placed into position ready for concreting. Beams can be prepared beforehand, and when dry can be hoisted into position, and by a special arrangement they can be made also to support the centering for the slabs. When beams are prepared beforehand, the ends of the ties are left free and are bent over the bars of the slab before concreting.

Post and Pillars

can be made round or square; longitudinal bars about $\frac{3}{4}$ in. to 1 in. being bound by $\frac{1}{4}$ in. spiral ties every 5 ins. Annealed wire is used at every intersection.

Piles

are made very much on the same principle as posts, except that sometimes the ties instead of being spiral are made of horizontal rings with ends bent in and around every two alternate longitudinal bars. These piles can be round with two flat sides for guiding, or square. The usual length is about 15 ft., but they are moulded horizontally, and made any length up to 60 ft. They are driven like wooden piles.

Walls,

which are generally only a few inches thick, are very good in cases where there is vibration—for instance, in mills, factories, engine-houses, &c. Reinforced concrete walls must be considered as partitions, and are only economical in cases where a brick wall would be very thick.

Keystones.

At Peterborough a Carnegie free library has been built at a cost of £6,500.

New Municipal Buildings at Bromley are proposed to be erected. Mr. F. G. Minter's tender of £18,793 has been provisionally accepted.

Mr. J. H. Langlands, who since 1886 has acted as architect to the Dundee School Board on an ad interim appointment, has been selected officially as the architect and measurer for the Board. Mr. T. Ogilvie has at the same time been appointed clerk of works.

Petition against Granite Sett Paving.—At a recent meeting of the Holborn Town Council a deputation from Lincoln's Inn Fields was received by the mayor and corporation in reference to paving the roadway with "silent material" in place of the noisy and unevenly laid granite setts. The petition, which was signed by nearly every firm in Lincoln's Inn Fields, was referred to the Streets Committee for consideration.

Garden City.—The number of houses occupied on the Garden City Estate is now about 150, representing a new population of more than 700 people. Of the new residents of 134 houses 19 are professional men, 14 contractors and master builders, 59 artisans, and 27 labourers. The Garden City Tenants, Ltd., have started a building scheme for the erection of 100 cottages on the estate. To meet the demands of the increasing population about £10,000 is being spent on extending the drainage scheme.

York Architectural Society.—At the recent annual dinner of this Society (Mr. Arthur Pollard, president, in the chair) Mr. Butler Wilson referred to the question of architects' registration. As a member of the Institute committee now considering the matter he said it was particularly pleasing to observe the assiduity with which provincial members followed in the business of the meetings, and he thought they must all be satisfied with the way in which the president of the Institute had taken the matter in hand.

Old East Riding Churches.—Mr. J. Shepherdson in a lecture before the Hull Literary Club on "The Village Churches of the East Riding" said that East Yorkshire, especially the Wold district, was particularly rich in specimens of Norman churches, and he described Wharrah-le-Street, Kirby Grindalythe, Thwing, Wetwang, Garton, Kirkburn, &c. Weaverthorpe was given as probably the most interesting specimen of a small Norman village church in the country. The church at Goodmanham was probably the oldest, and contained very early Norman work. Whilst in the Wold district the majority of the churches were undoubtedly of Norman origin, the Holderness churches were, generally speaking, of a later date.

Society of Engineers.—At the fifty-first annual general meeting, held recently, Mr. Maurice Wilson was elected president and Messrs. R. St. George Moore, J. W. Wilson and W. H. Holtum were elected vice-presidents. The president announced that the following premiums had been awarded by the Council for papers read during the past session:—The president's gold medal to Mr. Sherard Cowper-Coles for his paper on "The Metallic Preservation and Ornamentation of Iron and Steel Surfaces"; the Bessemer premium of books to Mr. E. R. Matthews for his paper on "The Parade Extension Works at Bridlington"; a Society's premium of books to Mr. B. L. Bradley for his paper on "The Grindleford Stone Quarries and their Working"; and a Society's premium of books to Mr. W. P. Digby for his paper on "Statistics of British and American Rolling Stock."

Views and Reviews.

The Architects' Law Reports.

The second volume of this admirable record of law cases affecting architects, surveyors, engineers, &c., is as complete as it is possible to make it, and will prove of inestimable value to all those interested in the law affecting buildings and streets. The compiler, Mr. Arthur Crow, F.R.I.B.A., assisted by Mr. A. F. Jenkin, barrister-at-law, as legal editor, has produced a bulky volume, but the report have been most judiciously selected, only the most important being inserted. These are all separately paged, and with their indices are complete in themselves. An improvement which will be welcomed is the insertion of some blank pages for press cuttings and memoranda. The recently-passed London Building Acts (Amendment) Act is included, with some useful legal notes on the same, and the cases are very fully reported and, where necessary, illustrated with plans and photographs, thus rendering the work of additional value. For the future the reports will proceed on the lines of a periodical legal review, in addition to the series of revised reports, and for the present it is proposed to issue it as important decisions arise. Developed on these lines, the publication is bound to become increasingly useful to the profession, and should be on the book-shelf of every architect.

"The Architects' Law Reports and Review," by Arthur Crow, F.R.I.B.A. London: 18, Prescott Street, E., price 10s. nett.

Competitions.

Old Kent Road Branch Library.—Plans are to be invited by the Southwark Borough Council for a branch library in the Old Kent Road. Premiums of £50, £30 and £20 will be offered.

Pavilion and Grand Stand, Darlington.—In a local competition among architects at Darlington Messrs. Kitching & Lee have been placed first for the proposed pavilion and grand stand for the Darlington Athletic and Cricket Club, to cost about £800. Ten sets of designs were submitted. Messrs. Kitching & Lee have been instructed to proceed with the building.

Cottages for Port Sunlight.—In the competition for cottages to be erected at Port Sunlight, instituted some time ago by Mr. Lever among members of the Liverpool Architectural Society, Messrs. Deacon & Horsburgh have been awarded the first place among architects in practice for the design of seven cottages (these to be carried out by them) and Mr. T. Taliesin Rees the second premium of £20; while Mr. Hazeby Adams gains first place among assistants for plans for five cottages (these to be carried out by him) and Mr. T. J. Miller Reid the second premium of £20.

Unsatisfactory Conditions.—The Competition Reform Society disapproves of the con-

ditions in the competition for a free library at Shaw because the limit of cost is insufficient and competitors are to state what part of their fee they will allow towards clerk of works' salary, &c. The society also warns its members that the conditions in the competition for the proposed school at Selby Oak for the King's Norton and Northfield U.D.C. are unsatisfactory, for the following reasons:—No premiums; the assessor will assist the promoters; no remuneration offered for the deferred portion of the school (two-thirds); limit of expenditure vague and the author of selected design must prepare working drawings and obtain tenders before his design is accepted (see last clause, p. 4); a perspective drawing is required; the site plan has to be verified by the competitor.

January's Elections at the Royal Academy will be in many ways the most interesting that have taken place for many years. There will be no fewer than seven elections. On January 8th two painter-sculptors or architect Associates will be elected in the place of Mr. David Murray and Mr. John MacAllan Swan, both of whom were raised to Academician's rank early in the present year. On the following evening three Royal Academicians—one English and two honorary foreign—will be elected. The English Academician's seat to be filled is that of the late Mr. H. H. Armstead, and probably this election will result in the return of another sculptor.

PLANNING UNDER DIFFICULTIES.



SETTLING ACCOUNTS.



POSSIBLE FUTURE REBUILDING OF PARK LANE, W.
(THE BATTLE OF THE STYLES)

OUR PLATES.

THE elevations of the new schools at Small Heath, Birmingham, are intended to be the outward expression of the general plan and arrangement. The rather unusual form is due chiefly to two things: (1) the construction of the roofs, which are all of breeze-concrete covered with asphalt; (2) the attempt to provide central halls with side lights instead of the rather too frequent roof lights. The reason for the first was a desire to reduce the cost of maintenance to a minimum, and for the second the improved internal appearance of the halls, and the possibility of a more architectural treatment. The materials employed in the external elevations are common bricks from Black

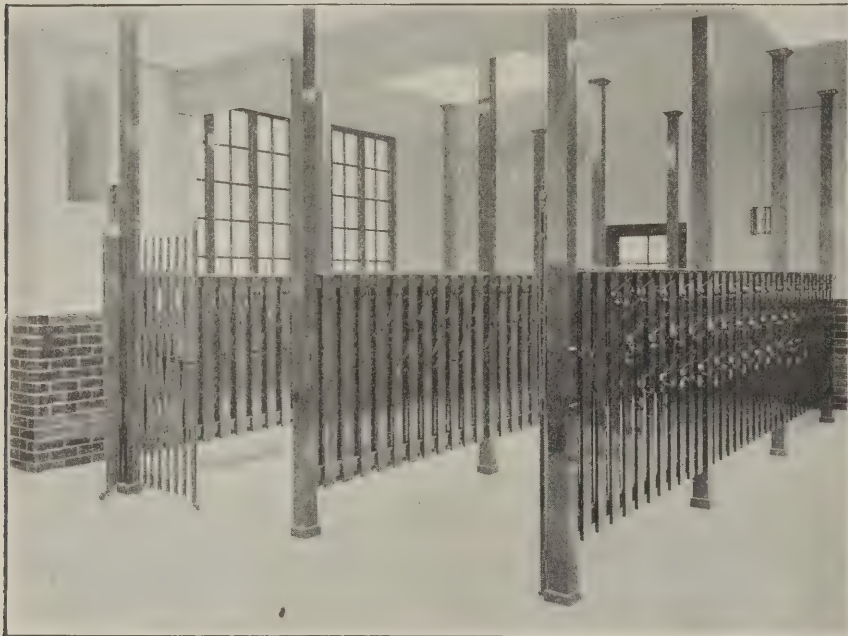
Country yards, with copings of Horseley Castle stone. Internally the walls are plastered and have dadoes of glazed bricks; floors of halls and classrooms being of pitch-pine blocks, and corridors and cloakrooms of granolithic. The heating and ventilation is on the "plenum" system, with low-pressure steam as a heating medium. Messrs. Buckland & Farmer, of Birmingham, are the architects.

The Coliseum Music Hall, which has been built in Eglinton Street, Glasgow, by the "Moss Empire" Syndicate, is claimed to be the largest theatre in the world. It was designed by Messrs. Frank Matcham & Co., of London. The auditorium, which is seated for 4,000 persons, has thirty-six exits.

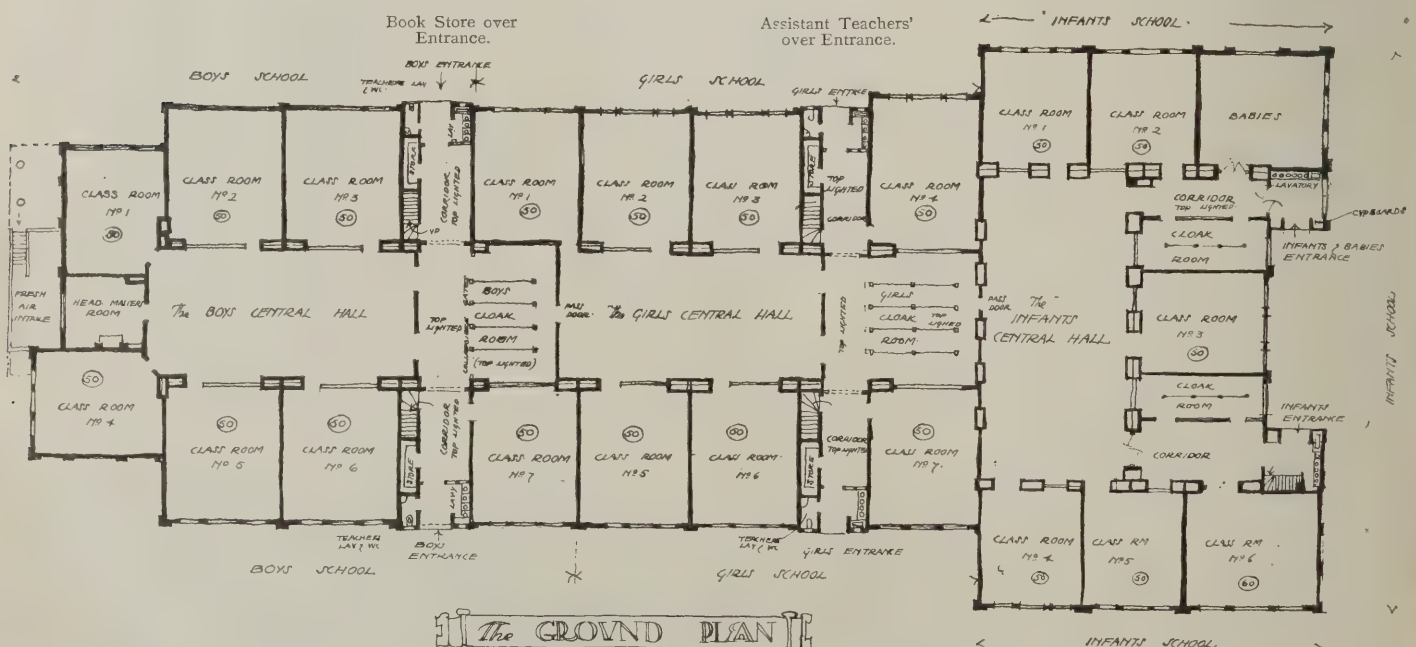
DEVELOPMENT OF CITIES.

PROF. BERESFORD PITE, F.R.I.B.A., delivered a lecture last week before the members of the Leeds Philosophical Society on "The Architectural Development of Cities." He said we had few instances at home that would repay attention like those at Liverpool, around St. George's Hall, and at Cardiff, in the Bute Park, where the new Municipal Buildings, Law Courts, University and Museum were being grouped on a grand scale in harmony with the picturesque adjoining castle. The new city plans would have to be sought abroad, on the Continent, or in America, or in our Colonial Empire. Probably Turin and Berlin were characteristic of the most modern schemes on the Continent. The special characteristics of the Continental cities just named, he said, were the extraordinary effects of aggregated public buildings, every one of which had a purpose and a meaning.

Referring to London he gave instances to show that each district or borough afforded opportunities for the local exercise of municipal patriotism, and he specially dwelt upon several of the most modern street improvements. The sweep of the curves of the river had afforded fine scope for the effective laying-out of London; and the Thames Embankment, to the beauty of which, he said, Englishmen were scarcely yet alive, came in for high praise. Along the river from Somerset House to Fulham the buildings punctuated the historical progress with architectural effect, which effect was not even excelled by the Champs Elysees. The laying-out of the Place de la Concorde and of the Tuilleries Gardens, however, was very instructive to all who had to lay-out public parks and gardens. The fine great school of architectural gardens seemed to have died out in England, and the art was lost so far as this country was concerned. The combining of trees with public buildings in the Champs Elysees and Unter den Linden had, in his opinion, a doubtful effect, for the trees interfered with the effect of the buildings.



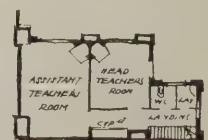
GIRLS' CLOAKROOM.



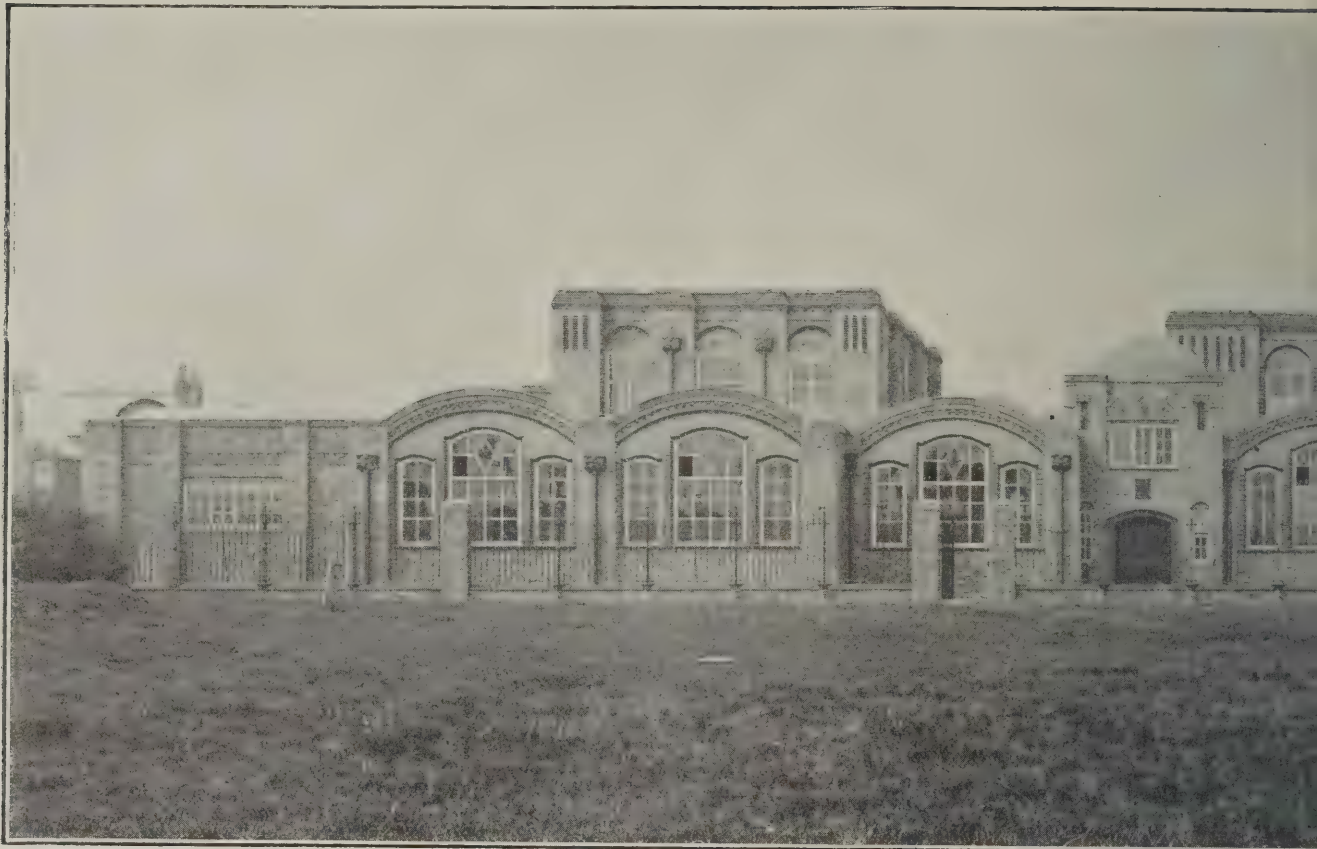
NEW SCHOOLS AT VICTORIA PARK, SMALL HEATH, FOR THE CITY OF BIRMINGHAM EDUCATION COMMITTEE. HERBERT T. BUCKLAND AND E. HAYWOOD-FARMER, ARCHITECTS.



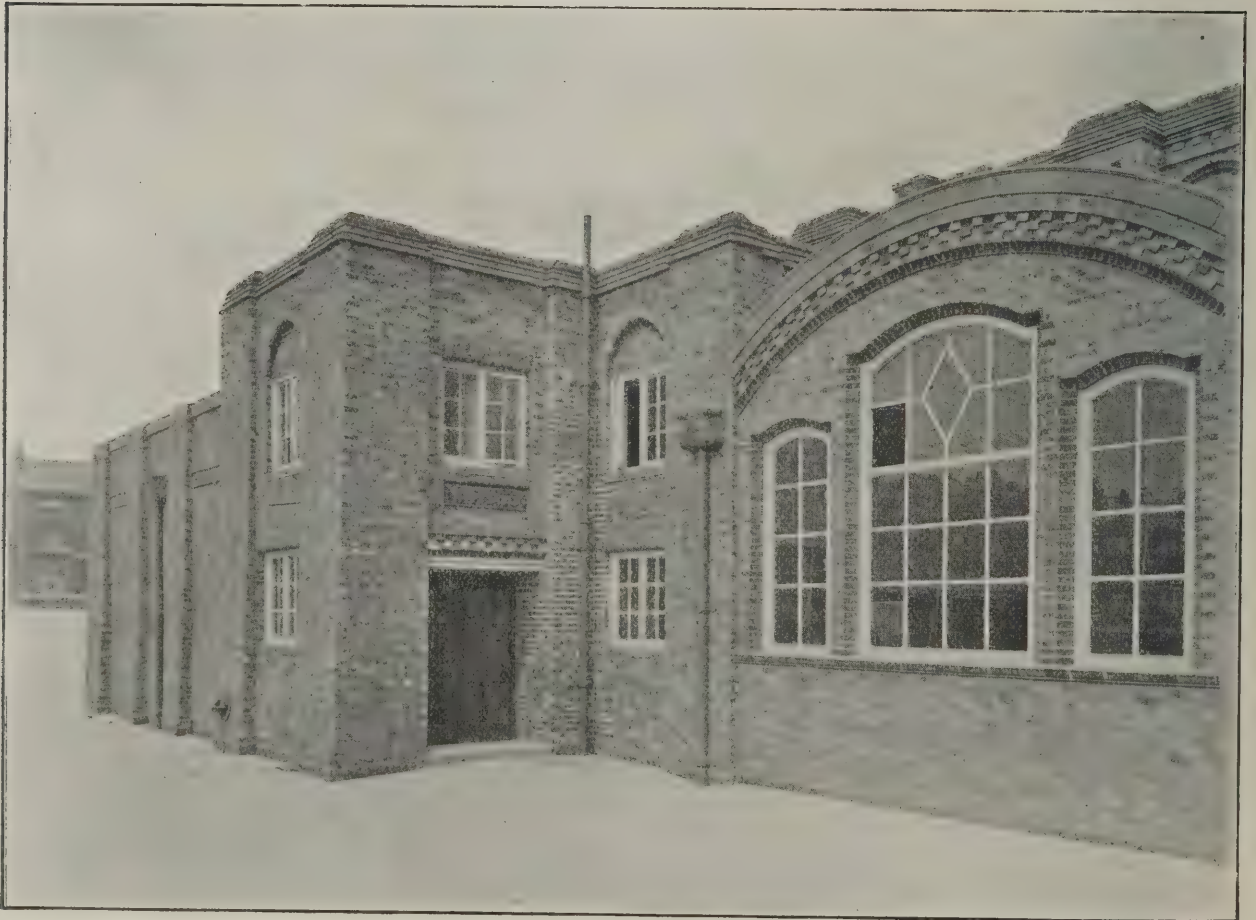
First-floor Plan over Infants' Entrance and Cloakroom.



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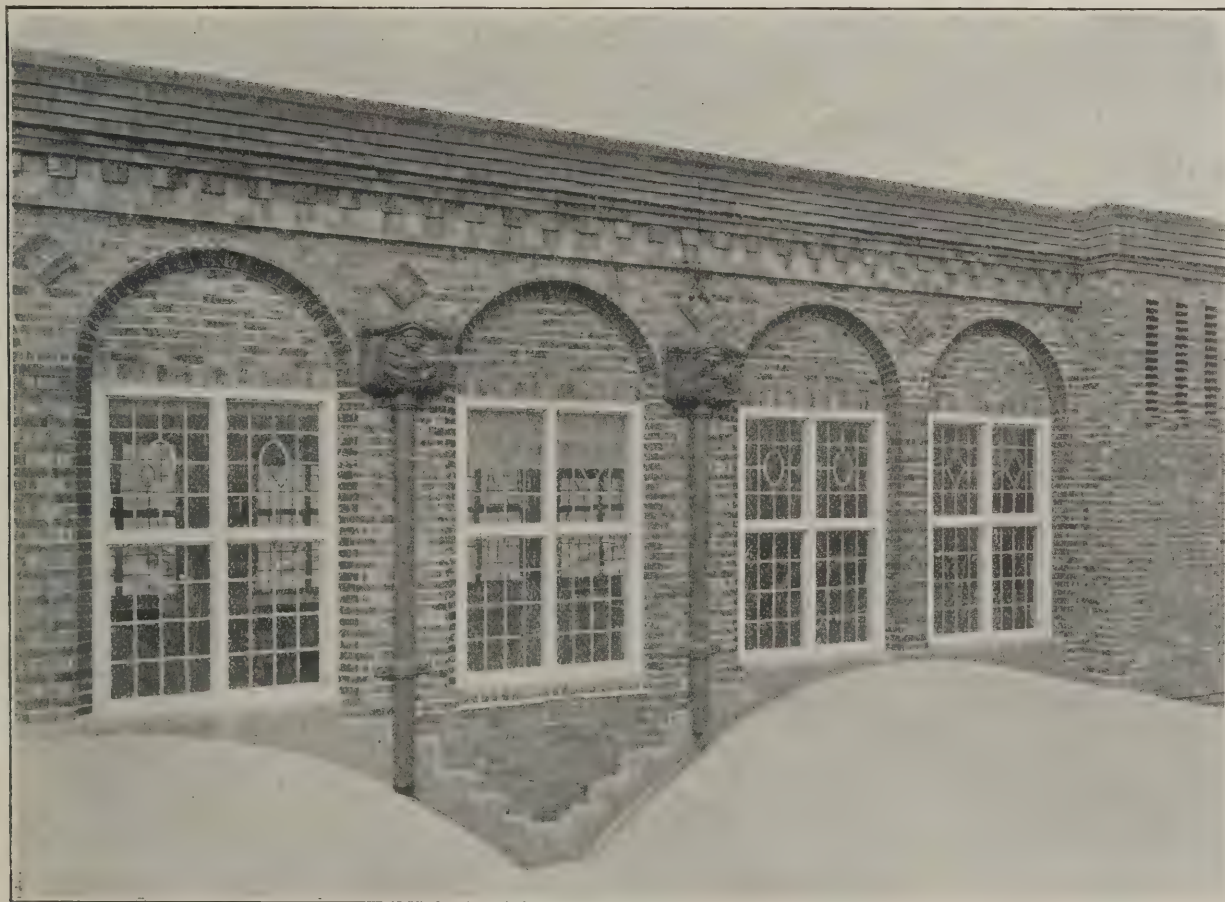


DETAIL OF INFANTS' ENTRANCE.

NEW BOARD SCHOOLS, SMALL HEATH, BIRMINGHAM.



VIEW.



DETAIL OF UPPER PART OF GIRLS' CENTRAL HALL.

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VELOGRAPHY.

THERE are several well-known processes by which copies of plans can be obtained. These include lithography, photolithography and photography, but all who have seen the work turned out by Norton & Gregory, Ltd., of Castle Lane, Buckingham Gate, S.W., must admit that their process (technically known as Velography) cannot be approached for general excellence and the speed with which copies can be produced. The process is a secret one, but Messrs. Norton & Gregory recently demonstrated to a number of press representatives the wonderful rapidity of their method. This was the more remarkable because of the exactness of detail. In fact, it may be briefly stated that by this process an absolutely correct copy is secured, without any of the shrinkage and distortion usually associated with photographic processes. This is obviously of the greatest importance. Velography, in short, has all the good points of the older methods with none of their drawbacks. The prices for copies are moderate and compare very favourably with other processes. Altogether Velography has a great future before it.

Builders' Notes.

Annual Dinners.—The Scarborough Master Builders' Association held its annual dinner on December 15th, Mr. R. H. Carr, president, occupying the chair. The Wigan and District Master Builders' Association also held its annual dinner on the same date, the chair being occupied by Councillor R. Bannister, J.P., the president, and the vice-chair by Mr. W. Livesay, the vice-president.

Telephone Address.—Messrs. Wailes, Dove & Co., Ltd., of Cromwell Buildings, the manufacturers and patentees of the well-known "Bitumastic" solution and enamels, due to their rapidly increasing business in Manchester and district, have had the National telephone installed in their local office at Cromwell Buildings, 11, Blackfriars Street, Manchester. Their number is 280x Central.

Building Trades in November.—In spite of the general improvement in employment, the building trades continue to be very dull. Employment in them, indeed, was rather worse in November than in October. The percentage of Trade Union members unemployed among carpenters and joiners was 8·3 at the end of November, as compared with 8·0 in October and 10·1 in November, 1904. The percentage for plumbers was 11·1 at the end of November, compared with 12·0 in October and 10·5 a year ago. A general and more than seasonal improvement may be confidently looked for, however, in the spring.

NEW LONDON BUILDINGS.

AT the last meeting of the London County Council the Building Act Committee reported the following applications under the London Building Act, 1894:—

An addition to No. 25, Clapham Road, Clapham, on the application of H. Wakeford & Sons, on behalf of H. J. Doughty. (*Consent.*)

Eleven houses on the north side of Halsmere Road, Flodden Road, Camberwell, on the application of P. Arundell & Sons. (*Consent.*)

Projecting porches to seven houses on the south side of Rodenhurst Road, Clapham, on the application of J. Carmichael. (*Consent.*)

Buildings on the side of Nos. 24 and 26, Peckham Rye, Dulwich, to abut also upon Nigel Road, on the application of W. T. Champion. (*Consent.*)

Buildings on the south side of Upper Richmond Road, Putney, eastward of Roehampton Lane, on the application of E. J. Partridge, on behalf of H. J. Hawkins. (*Consent.*)

Iron and glass shelter in front of the main entrance to the Hotel Russell, Russell Square, Holborn, on the further application of J. W. Singer & Sons, Ltd., on behalf of the Fredericks Hotel Co. (*Consent.*)

Three houses, and the retention of nine houses, on the east side of Garratt Lane, Wandsworth, between Quinton Street, and Littleton Street, and the retention of a house on the west side of Tranmere Road, abutting upon Quinton Street, on the application of Holloway Brothers. (*Consent.*)

Two houses, with bay windows and porches, on the north side of Garratt Lane, Lower Tooting, between the houses known as Coplestone House and No. 1, Alice Terrace, on the application of W. & C. Brown. (*Consent.*)

Re-erection of Nos. 74, 8, 9 and 10 Paddington Green, Paddington, on the application of W. F. Meakin & Son, on behalf of Brooks, Phillips & Co. (*Refusal.*)

Buildings on the site of No. 247, Lower Road, Deptford, on the application of J. H. Bethell, on behalf of H. Belsham. (*Refusal.*)

Projecting showcase in front of No. 60, New Bond Street, St. George, Hanover Square, on the application of S. Godward. (*Refusal.*)

Buildings with external walls at less than the prescribed distance from the centres of the roadways of Wood's Buildings and King's Court, Great Eastern Street, Hoxton, on the application of T. H. Smith, on behalf of Brown Brothers, Ltd. (*Consent.*)

Retention of a cycle house of a temporary character in front of No. 26, Victoria Road, Kensington, on the application of D. F. Pennant. (*Consent.*)

Retention of a cycle house of a temporary character erected in front of No. 22, Sisters' Avenue, Battersea, on the application of J. W. Mead. (*Consent.*)

Five projecting pilasters on the Ficcadilly frontage and five projecting pilasters on the Old Bond Street frontage of buildings upon the site of Nos. 44, 45 and 46, Old Bond Street, and Nos. 57, 58, 59 and 60, Piccadilly, St. George, Hanover Square, on the application of Read & MacDonald. (*Consent.*)

Addition of iron brackets and electric lights to an iron and glass shelter at the entrance of the Gaiety restaurant, Strand, on the application of Jones & Willis, Ltd. (*Consent.*)

A building with a projecting balcony in front on the southern side of the Embankment, Putney, eastward of Ruvigny Mansions, on the application of Bartlett & Ross, on behalf of G. Ayling. (*Consent.*)

Erection of No. 22, Atherfold Street, Stockwell, with a projecting portico, on the application of V. Vagnolini, on behalf of W. P. Goosey. (*Consent.*)

One-storey shops in front of Nos. 3 to 10 (inclusive) and 13 to 16 (inclusive), Magdalen Parade, Garratt Lane, Earlsfield, on the application of T. Sheppard & Co. (*Consent.*)

Buildings on the south-east side of Wyndham Road, Camberwell, at the rear of the "Clarendon" public-house, on the application of F. A. Powell, on behalf of W. Smith. (*Refusal.*)

Additions to No. 154, Stanstead Road, Lewisham, to abut upon Colfe Road, on the application of G. Tolley, on behalf of A. McLean Cato. (*Refusal.*)

Buildings upon the site of Nos. 299 and 301, Stanstead Road, Lewisham, to abut upon Stanstead Road and Ravensbourne Road, on the application of Norfolk & Prior, on behalf of J. Watt. (*Refusal.*)

Buildings on the north-east side of Maida Vale, Marylebone, to abut upon Maida Vale and St. John's Wood Road, on the application of V. S. Galsworthy, on behalf of the Governors of Harrow School. (*Refusal.*)

Fences in front of Nos. 1 and 3, Wagner Street, Peckham, at less than the prescribed distance from the centre of the roadway of such street, on the application of J. B. Choate, on behalf of B. Gale. (*Refusal.*)

Block of flats on the eastern side of St. John Street, Clerkenwell, to abut also upon Rawston Street, on the application of A. Kent, on behalf of G. E. Chamberlain. (*Consent.*)

Two iron gangways connecting the first and second floors of buildings on the north and south sides of Kennedy Court, Newton Street, Holborn, and two inclined iron gangways and an iron ladder in front of the building on the south side of the same court, on the application of J. Walters. (*Consent.*)

Two iron and glass shelters in front of the Hyde Park Hotel, Knightsbridge, on the application of the Crittal Manufacturing Co., Ltd., on behalf of the Hyde Park Hotel, Ltd. (*Refusal.*)

Complete List of Contracts Open.

DATE OF DELIVERY.		WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING:				
Dec. 28	28	Batley—Warehouse...	Education Committee	J. Kirk & Sons, Architects, Huddersfield.
" 28	28	Nottingham—Repairs to Store Buildings	Guardians	F. B. Lewis, City Architect, Guildhall, Nottingham.
" 28	28	Blackley—Infirmary, &c.	D. Phillips	T. Worthington & Son, Architects, 46 Brown Street, Manchester.
" 28	28	Brynteg—Villa	H.M. Office of Works	C. M. Davies, 112 High Street, Brynteg, Merthyr.
" 29	29	Carmarthen—Post-office	Bishop of Truro	Secretary, H.M. Office of Works, Storey's Gate, London, S.W.
" 29	29	Tywardreath—Farmhouse	Walter Hicks	T. H. Andrew, Architect, Market Hill, St. Austell.
" 29	29	Fowey—Alterations, &c.		T. H. Andrew, Architect, Market Hill, St. Austell.
" 30	30	Caergwrle—Villas		J. T. Dennis, c/o W. E. Jones, Lakefield House, High Street, Caergwrle.
" 30	30	Gravesend—Additions	Town Council	Borough Surveyor's Office, Town Hall, Gravesend.
" 30	30	Redmile and Carlton—Rebuilding Bridges	County Council	County Surveyor's Office, Northallerton.
" 30	30	Caerau—Hospital	Rural District Council	J. H. James, Architect, 18 Quay Street, Cardiff.
" 30	30	Preston—School	Education Committee	Education Offices, Lancaster Road, Preston.
" 30	30	Docking—Repairs	Guardians	J. Morris, Surveyor, Dorset House, Heatham.
" 30	30	Llandaff and Dinas Powis—Hospital	Rural District Council	J. H. James, 18 Quay Street, Cardiff.
Jan. 1 1906.	1	Romford—Class-rooms, &c.	Education Committee	Education Committee's Office, 44 Eastern Road, Romford.
" 1	1	Nottingham—School	Education Committee	F. B. Lewis, City Architect, Guildhall, Nottingham.
" 1	1	Bingley—School	Education Committee	Divisional Clerk's Office, Town Hall, Bingley.
" 2	2	London, S.E.—Sorting-office	H.M. Office of Works	J. Wager, H.M. Office of Works, Westminster, S.W.
" 3	3	Newport—Extension, &c.	Gas Co.	T. Canning, Engineer, Gasworks, Mill Street, Newport, Mon.
" 3	3	Plymouth—Buildings	Corporation	J. Paton, Borough Surveyor, Municipal Offices, Plymouth.
" 5	5	Little Bromley—School	Education Committee	W. Whitmore, County Architect, Duke Street, Chelmsford.
" 5	5	Llandilo—Additions and Alterations to Council School	Carmarthenshire Education Committee.	F. D. Jenkins, M.S.A., M.R.S.I., County Education Architect, Shire Hall, Carmarthen.
" 5	5	Bryndu—Additions and Alterations to Council School	Didto	Didto.
" 5	5	Brynamman—Heating Apparatus and Repairs at Council School.	Didto	Didto.
" 5	5	Betws—Repairs to Council School	Didto	Didto.
" 5	5	Hillfield—Ventilation and Folding Partitions at Council School.	Didto	Didto.
" 5	5	Castle—Ventilation, Lighting and Repairs at Council School.	Didto	Didto.
" 6	6	Manchester—School...	Education Committee	Education Offices, Deansgate, Manchester.
" 8	8	Gayton—Additions, &c.	Guardians	L. T. Eagleton, Architect, King Street, King's Lynn.
" 8	8	Carlisle—Cottages	Corporation	James Mansergh & Sons, Engineers, 5 Victoria Street, S.W.
" 8	8	Merthyr Tydfil—Rebuilding	N. W. & O. Morgan	T. Edmund Rees, Architect, Merthyr Tydfil.
" 9	9	Sunderland—Customs Offices, &c.	H.M. Office of Works	Mercantile Marine Office, Sunderland.
" 9	9	Clutton—Alterations, &c.	Guardians	W. F. Bird, Architect, Midsomer Norton.
" 9	9	Bungay—School	Education Committee	A. Pells, Architect, Beccles, Suffolk.
" 11	11	Lancaster—Town Hall	Corporation	E. W. Mountford, Architect, 17 Buckingham Street, Strand, W.C.
" 11	11	Wembley—Houses	Great Central Railway Co.	Engineer's Office, Marylebone Station, London.
" 12	12	Cookham—Schools	Education Committee	Secretary, Education Committee, The Forbury, Reading.
" 15	15	Ystradgynlais—Chapel	Trustees	P. Morgan, Penrhos, Ystradgynlais, Wales.

Complete List of Contracts Open.—continued.

DATE OF DELIVERY.	WORK TO BE EXECUTED.	FOR WHOM.	FROM WHOM FORMS OF TENDERS MAY BE OBTAINED.
BUILDING—cont.			
Jan. 15	Ipswich—School	Education Committee	J. A. Schenermann, Architect, 23 High Street, Ipswich.
" 16	Bury St. Edmunds—Alterations, &c.	County Council	A. Ainsworth Hunt, County Architect, Sudbury.
" 17	Uxbridge—Workhouse Extensions	Guardians	W. L. Eves & J. Freebairn Stow, Architects, Uxbridge.
" 17	Llandudno—School	Governors	G. A. Humphreys, Architect, Llandudno.
ENGINEERING:			
Dec. 30	Longton—Filters, &c.	Town Council	J. W. Wardle, Borough Surveyor, Court House, Longton.
" 30	Becking—Sinking Borehole, &c.	Parish Council	E. H. Bright, Engineer, Dodds Hall, Braintree.
Jan. 1906.	Bishopstoke—Bridge	County Council	W. J. Taylor, County Surveyor, The Castle, Winchester.
" 1	Womtwell—Heating Apparatus... ..	County Council	County Hall, Wakefield.
" 2	London, S.E.—Water-heater, &c.	Guardians	Guardians Offices, Brook Street, Kennington Road, S.E.
" 2	Widnes—Gasholder Tank... ..	Corporation... ..	J. Carr, Engineer, Widnes.
" 2	Widnes—Gasholder... ..	Corporation... ..	J. Carr, Engineer, Widnes.
" 3	Newport (Isle of Wight)—Repairs to Engine, &c.	Corporation	H. R. Hooper, Town Clerk, Newport, Isle of Wight.
" 3	London, E.C.—Deck Bridges	East Indian Railway Co.	C. W. Young, Secretary, Nicholas Lane, London, E.C.
" 6	Lydd—Water Tower	Water Co.	A. F. Phillips, Engineer, 38 Parliament Street, S.W.
" 8	Shaw—Sludge-Fressing Machinery	Urban District Council	T. Mitchell, Sewage Works Superintendent, Shaw.
" 9	Auckland—Wharf, &c.	Harbour Board	W. & A. McArthur, 150 Leadenhall Street, London, E.C.
" 10	Southsea—Pier Extension... ..	Pier Company	A. H. Bone, Engineer, 148 High Street, Portsmouth.
" 10	West Hartlepool—Reconstruction of Graving Dock	North Eastern Railway Co.	T. M. Newell, Engineer, Dock Office, Hull.
" 10	Sutton—Wire-wards, &c.	Metropolitan Asylums Board	Metropolitan Asylums Board, Embankment, London, E.C.
May 1	Talcahuano, Chili—Dock ... ..	...	Direccion de Material, Valparaiso.
IRON AND STEEL:			
Dec. 28	Manchester—Rainwater Pipes	Guardians	E. W. Ogden, Clerk, Union Offices, Cheetham Hill Road, Manchester.
Jan. 1906.	Bury—Iron Castings	Water Board	R. B. Rigby, Waterworks Engineer, Parsons Lane, Bury.
" 4	Tonnes—Fencing	Rural District Council	S. S. Rendle, Highway Surveyor, Hillside, Marlton Road, Paignton.
" 5	Manchester—Iron and Steel Work	Gas Committee	C. Nickson, Superintendent, Gas Department, Town Hall, Manchester.
" 16	London, S.W.—Slot Rails... ..	County Council	Engineer's Department, County Hall, Spring Gardens, S.W.
PAINTING AND PLUMBING:			
Dec. 28	Cowdenheath—Painting	Burgh Commissioners	T. Hyslop Ure, Architect, 43 Carnegie Street, Dunfermline.
" 30	Brymbo—Painting	Wesleyan Chapel	S. C. Hughes, 22 High Street, Brymbo, Wales.
ROADS AND CARTAGE:			
Dec. 30	Horsham—Materials, &c.	County Council	W. McIntosh, County Surveyor, 22 Worthing Road, Horsham.
Jan. 1906.	Chelmsford—Granite ?	Guardians	W. W. Duffield, Clerk, 95 High Street, Chelmsford.
" 2	Willesden—Flag-paving	District Council	C. Claude Robson, Engineer, Public Offices, Dyne Rd., Kilburn, N.W.
" 2	Dartford—Street Works	Urban District Council	T. E. Tiffin, Surveyor, Council Offices, Dartford.
" 2	Leyton—Street Works	Urban District Council	W. Dawson, Surveyor, Town Hall, Leyton.
" 3	Consett—Streets	Urban District Council	W. S. Shell, Surveyor, Parliament Street, Consett.
" 3	Ramsgate—Street Works	Corporation... ..	Borough Engineer's Office, Ramsgate.
" 14	Midhurst—Macadam, &c.	Rural District Council	A. G. Gibbs, Surveyor, Council Offices, Midhurst.
SANITARY:			
Dec. 28	Merthyr Tydfil—Drainage System	Guardians	T. Roderick, Architect, Clifton Street, Aberdare.
" 29	Spondon—Scavenging	Rural District Council	J. W. Newbold, Clerk, Becket Street, Derby.
Jan. 1906.	New Malden—Sewer	Urban District Council	A. W. Hobbs, Sanitary Inspector, Council Offices, New Malden.
" 2	Hove—Drainage Works	Town Council	H. Hamilton Scott, Borough Surveyor, Hove.
" 4	Rishton—Sewage-disposal Works	Urban District Council	C. J. Lomax, Engineer, 37 Moss Street, Manchester.
" 4	Burton-upon-Trent—Sewers	Corporation... ..	C. T. Lynam, Surveyor, Town Hall, Burton-upon-Trent.
" 8	Jarrow—Scavenging, &c.	Council	J. Petree, Borough Surveyor, Jarrow.
" 22	Shelf—Sewage Works	Urban District Council	J. Drake & Son, Engineer, Queensbury, near Bradford.
" 24	Ashchurch—Sewage-disposal Works	Rural District Council	H. A. Badham, Clerk, Tewkesbury.
TIMBER:			
Jan. 19	London, S.W.—Timber	Crown Agents	Crown Agents for the Colonies, Whitehall Gardens, London, S.W.

List of Competitions Open.

DATE OF DELIVERY.	DESIGNS REQUIRED.	AMOUNT OF PREMIUM.	DEPOSIT REQUIRED FOR CONDITIONS, &c.	FROM WHOM PARTICULARS MAY BE OBTAINED.
1906.				
Jan. 31	Hackney—Library	50, 30 and 20 guineas	£1 is.	W. A. Williams, Town Clerk, Town Hall, Hackney.
" 31	Crompton—Library	£30, £20 and £10	10s. 6d.	F. F. Gartside, Clerk, Town Hall, Shaw, near Oldham.
Feb. 15	Wrexham—Schools (W. E. Willink, Assessor)	£50, £30	£1 is.	Clerk to Education Committee, Wrexham.
Mar. 31	Birmingham—Council House Extension (Sketch Plans).			Town Clerk, Council House, Birmingham.

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Tenders.

Addressed postcards on which lists of tenders may be stated will be sent post free on application to the Manager, BUILDERS' JOURNAL, Great New Street, Fetter Lane, E.C.

Information from accredited sources should be sent to "The Editor" at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Appleby.—For the erection of an engine-house, boiler-house, coal store and dwelling-house, and for sinking a well in the parish of Appleby, for the Brumby and Frodingham District Council. Mr. Alfred Atkinson, C.E., engineer, Brigg:—

J. Arundel's Exors., Bradford	£3,137 19 6
R. H. B. Neal, Ltd., Plymouth	1,813 0 0
R. C. Brebner & Co., Edinburgh	1,699 4 0
H. J. Thompson, Scunthorpe	1,589 7 6
T. C. Starkey, Hull	1,575 4 1
E. Good & Sons,* Alpha Works, Main Street, Hull	1,311 14 2
T. Cuthbert,† Nottingham	1,270 0 0
A. J. Elmes, Gainsborough	1,204 0 0

* Accepted. † Withdrawn.

Barnard Castle.—For alterations and additions to Wesleyan day school's, Cothelstone. M. S. Farrow, architect, 7, Market Place, Barnard Castle:—

W. Bateson, Stainton.
Nelson & Hartley, Stainton.
J. Hetherington, Cothelstone.
J. P. Robinson, Lartington.
J. Wandless.
J. Wilson,* Cothelstone.

* Accepted. [All of Barnard Castle.]

Barnton.—For the erection of a new school to accommodate 300 children, for the Administrative Sub-Committee for the Northwich District:—

T. Leicester, Northwich	£5,180
T. Smith & Son, Crewe	4,833
Pickstock & Royle, Holmes Chapel	4,688
R. Carlyle, Old Trafford	4,678
T. & W. Meadows, Stockport	4,590
F. Matthews, Nantwich	4,475
E. W. Bostock, Northwich	4,420
S. Appleton, Northwich	4,409
H. Fairclough, Warrington	4,310
J. Mayers & Son, Chester	4,300
T. G. Huxley,* Malpas	4,050

* Recommended for acceptance.

Croydon.—For the erection of a school for 1,256 children proposed to be built in Winterbourne Road, Thornton Heath, for the Education Committee. Mr. H. Carter Peggs, F.R.I.B.A., architect, Thornton Heath:—

Hughes & Stirling, Strand	£21,126
C. Wall, Ltd., Chelsea	20,204
Marriott & Slater, Caterham Valley	20,050
G. Everitt, Croydon	19,900
Daan & Co., Croydon	19,912
Bowen & Sons, Birmingham	19,837

E. P. Bulled & Co., Croydon	£19,797
Grace & Marsh, Croydon	19,705
Jones & Andrews, Beckenham	19,647
J. Shelbourne & Co., Wandsworth	19,325
Willcock & Co., Wolverhampton	19,300
H. Kent, Lewisham	19,220
Norman & Burt, Burgess Hill	19,189
W. Johnson & Co., Wandsworth Common	19,171
Oak Building Co., Cambridge	18,985
J. Smith & Sons, South Norwood	18,888
Foster & Dicksee, Rugby	18,888
Drowley & Co., Woking	18,880
J. E. Johnson & Son, Westminster	18,692
Martin, Wells & Co., Vauxhall	18,570
Kerridge & Shaw, Cambridge	18,526
J. & M. Patrick, Wandsworth	18,409
F. G. Minter, Putney	18,334
E. J. Saunders, Croydon	18,289
G. Wales & Co., South Hackney	18,247
W. Smith & Son, Croydon	17,983
Spencer, Santo & Co., Kensington	17,907
Gann & Co., Whitstable	17,848
G. E. Wallis & Sons, Maidstone	17,760
B. E. Nightingale, Albert Embankment	17,753
Gathercole Brothers, Norbury	17,400
A. Faulks, Loughborough	17,285
W. Lawrence & Son, Waltham Cross	16,994
R. Cook & Son, Crawley	16,930
A. Hudson & Co., Westminster	16,877
W. Moss & Sons,* Loughborough	16,760

* Accepted.

Enfield.—For the erection of a new post-office Enfield, for H.M. Office of Works, &c.:—

W. Pavey & Son	£5,725 0 0
J. Thomas	5,223 0 0
L. & W. H. Patman	5,185 0 0
F. & A. Willmott	4,984 0 0
R. Jackson	4,711 11 0
Rowley Brothers	4,576 0 0
Thomas & Edge	4,567 0 0
J. & M. Patrick	4,499 0 0
Mattock & Parsons	4,487 0 0
Pollard & Brand	4,438 0 0
B. E. Nightingale	4,429 0 0
J. Cracknell	4,422 0 0
Speechley & Smith	4,395 0 0
W. Lawrence & Son	4,384 0 0
Press, Robinson & Co.	4,346 0 0
A. Monk	4,312 0 0
J. Jarvis & Sons	4,300 0 0
Almond & Son	4,187 0 0
Edwards & Medway	4,170 0 0
A. Fairhead & Sons*	4,159 0 0
W. H. Hyde	4,032 0 0

* Accepted.

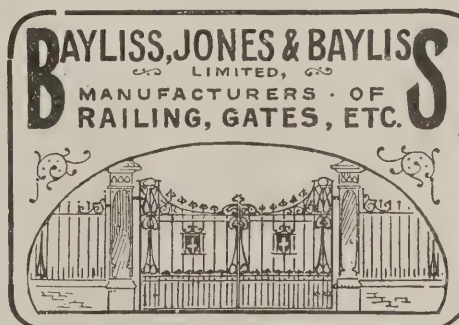
Whaddon.—For rebuilding Whaddon Vicarage, near Royston. Mr. W. Milner Fawcett, M.A., architect, Cambridge:—

Taylor	£1,600
Gimson	1,524
Jacklin	1,480
Wade,* St. Neots	1,452

* Accepted.

(Continued on p. xxxv.)

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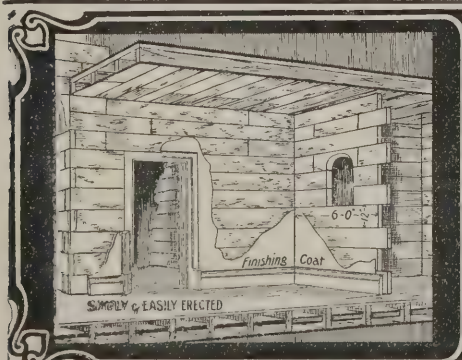
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Agents.—Mr. C. A. Line, 81, Albert Street, Dale End Birmingham. Messrs. T. Cordingley & Sons, Thorncliffe Road, Bradford. Messrs. J. Tanner & Son, 3, Gill Street Liverpool. Messrs. Stuart's Granolithic Stone Co., Ltd., 46, Duff Street, Edinburgh. Messrs. W. D. Henderson & Son, 55, Waring Street, Belfast.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion not exceeding four lines, and 6d. per line afterward, prepaid. Three insertions may be had for the price of two. Advertisements must reach the Office not later than 5 o'clock on Monday.

ARCHITECT'S ASSISTANT (24) desires ENGAGEMENT; working drawings, details, perspective, quantities, &c. Good designer and colourist.—A. BREV PRITCHARD, The Grove, Rhyl, North Wales. 1537

ARCHITECT'S ASSISTANT disengaged; 13 years' provincial experience. Design, working drawings, details, quantities, and supervision of works.—Box 1520, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT'S ASSISTANT seeks SITUATION, age 21. Five years pupil of well-known London architect. Has designed and carried out over £7,000 of building work on own responsibility. Excellent references. Salary, 28s.—A. B., 82, Grosvenor Street, W. 1501

ARCHITECT'S ASSISTANT (nearly 22); over 5 years' London experience; student R.I.B.A.; design, working drawings, surveying, specifications, perspectives, correspondence, and general routine; salary moderate.—M., 7, Goulton Road, N.E. 1507

ARCHITECT'S ASSISTANT desires engagement in a London firm of Architects; good draughtsman, 6 years' experience and good references. Design, working and detail drawings, perspectives, &c. Moderate salary.—Apply E. O. N., 98, Elspeth Road, Clapham, S.W. 1518

ARCHITECTURAL DRAUGHTSMAN, 12 years' London and Provincial experience, requires engagement (28). Designs, working and detail drawings, specifications, perspectives, surveys and general routine, excellent references from leading firms. Salary 2½ guineas.—Hookway, 36, Juer Street, Battersea Park, S.W. 1516

ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT (23), seeks situation. London experience; good draughtsman, detail and small scale drawings; five years' general experience; good references; moderate salary.—B. A. E., "Glebeside," Preston Park, Brighton. 1512

ARCHITECT and ENGINEER'S ASSISTANT, age 26, desires ENGAGEMENT; 11 yrs. exp.; good draughtsman, surveying, levelling, quantities, supervision of works. Salary, £3.—RICHARD P. BLAKEY, 4, Zion Terrace, Sunderland. 1493

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ARCHITECT and SURVEYOR'S ASSISTANT (23), 6 years' exp.; good draughtsman, working drawings, details, surveying, levelling; assist with quantities. Salary 35s.—Box 1546, BUILDERS' JOURNAL Office, 6, Great New Street, Fetter Lane, E.C.

ARCHITECT and SURVEYOR'S JUNIOR ASSISTANT (22), 6 years' sound general experience, desires appointment with opportunity of developing knowledge. Good draughtsman, dilapidations, &c.—E. W., 10, Roseneath Road, New Wandsworth, S.W. 1548

ARCHITECT'S JUNIOR ASSISTANT seeks ENGAGEMENT; whole or part time; 5 years' experience. Good draughtsman, tracer, &c.—A. S., 119, Finsbury Pavement, E.C. 1482

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Sketch Plans only are required to be sent in by MARCH 31, 1906, and from those submitted a selection of not less than six nor more than ten will be made, the authors of the selected designs receiving each an honorarium of 100 guineas upon submitting complete Designs in a final competition amongst those so selected.

The Corporation has appointed Sir ASTON WEBB, R.A., and Mr. E. INGRESS BELL to act for them as their Professional Advisers in this competition.

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Legal Notice.

PATENTS, DESIGNS, AND TRADE MARKS ACTS, 1883-1902.

NOTICE is hereby given that JOHN HENRY DUKE, of 247, North Boulevard, Hull, seeks leave to amend the Specification of Letters Patent No. 288, 1905, granted to him for "Improvements in and relating to Valves with removable seats." Particulars of the proposed Amendment were set forth in the Illustrated Official Journal (Patents) issued on the 29th November 1905.

Any Person, or Persons, may give Notice of Opposition (on Form G) at the Patent Office, 25, Southampton Buildings, London, W.C., within one calendar month from the date of the said Journal.

C. N. DALTON,
Comptroller-General.

TENDERS—cont. from p. xxxiii.

Erith.—For the erection of a technical institute and secondary day school, for the Education Committee:—

E. Proctor & Son, Plumstead, S.E.	£14,240	0	9
Thompson & Beveridge, London, W.	13,283	0	0
Martin, Wells & Co., Vauxhall, S.E.	13,425	0	0
Thomas & Edge, Woolwich, S.E.	12,754	4	0
J. Willford, Snodland, Kent	12,660	0	0
Kirk & Kirk, Westminster	12,668	0	0
F. & E. Davey, Southend-on-Sea	12,558	0	0
Harris & Wardrop, Limehouse, E.	12,539	0	0
J. Carmichael, Wandsworth, S.W.	12,265	0	0
H. L. Holloway, Deptford, S.E.	12,430	0	0
Parren & Son, Earith, Hunts	12,190	9	7
H. Lovatt, Wolverhampton	12,057	0	0
Gibson & Co., Hendon, N.W.	12,037	0	0
Bowyer & Co., Upper Norwood	12,000	0	0
S. E. Moss, Southend-on-Sea	11,966	11	8
Myall & Upson, Clacton-on-Sea	11,929	0	0
Ellingham & Son, Dartford, Kent	11,874	1	4
Gunning & Son, Erith	11,832	15	0
C. G. Hill, South Place, E.C.	11,786	0	0
Kirk & Randall, Woolwich, S.E.	11,716	0	0
Appleby & Son, Lambeth, S.E.	11,680	0	0
Enness Brothers, Erith	11,635	1	3
Gough & Co., Hendon, N.W.	11,630	0	0
Johnson & Son, Westminster, S.W.	11,467	0	0
W. Lawrence & Son, Waltham Cross	11,427	0	0
Friday & Ling, Northend, Erith	11,426	16	3
B. E. Nightingale, Albert Embankment, S.E.	11,377	0	0
Barker & Co., Kensington	11,351	0	0
W. F. Blay, Dartford	11,261	6	2
W. Moss & Son, Loughborough	11,120	0	0
G. Gates, Rochester	10,974	0	0
A. Faulks, Sparrow Hill, Loughborough	10,870	14	9

* Accepted.

Grimsby.—For building the Park Congregational Mission Church, at the corner of Humberstone and Durban

Ipswich.—For the erection of a new boiler-house, chimney-shaft, lavatories, &c., at St. John's Home, for the Guardians. Mr. H. J. Wright, architect, Museum Street, Ipswich:—

Boiler-house.		Lavatories, &c.		Seating.	
G.A. Kenney	£893 10 0	£666 0 0	£157 10 0		
W. Grayston	700 0 0	589 0 0	163 0 0		
Parkington & Son	755 0 0	525 0 0	160 0 0		
A. Gayford	735 2 0	509 4 0	148 10 0		
James & Gower	665 0 0	539 0 0	153 0 0		
Scales & Robins	660 0 0	519 0 0	160 0 0		
C. Barrett	620 0 0	510 0 0	190 0 0		
Catchpole & Sons	637 0 0	539 0 0	139 0 0		
V. A. Marriott	629 0 0	532 0 0	135 0 0		
H. J. Linzell	645 0 0	521 0 0	135 0 0		
W. H. Death	645 0 0	499 0 0	118 0 0		
G. Grimwood & Sons	645 0 0	517 0 0	123 0 0		
C. A. Green	587 3 9	337 0 0	129 3 0		
W. H. Bloomfield	580 0 0	500 0 0	160 0 0		
J. C. Smith	572 0 0	520 0 0	146 0 0		

* Accepted.

Roads. Mr. E. Goodhand, architect, Osborne Chambers Grimsby:—

G. & J. Smith	£1,700	0	0
Hewins & Goodhand	1,697	0	0
W. Gilbert	1,600	11	0
J. Brown	1,566	7	3
J. H. Thompson & Son, Victoria Street	1,497	0	0

* Accepted.

Heacham.—For the erection of new schools play sheds, latrines, &c., and master's house. Mr. Herbert J. Green, architect and diocesan surveyor, 31, Castle Meadow, Norwich:—

F. Southgate, Hunstanton	£4,664	2	10
Spencer, Santo & Co., Felixstowe	4,631	17	10
Read & Wildbur, King's Lynn	4,368	11	4
T. Anderson, King's Lynn	4,359	11	7
J. J. Bone, King's Lynn	4,298	0	0
J. Cracknell, Peterboro'	4,233	0	0
R. Dye, King's Lynn	4,197	15	0
J. Guttridge, Peterboro'	4,119	2	6
J. Medwell, King's Lynn	4,117	13	0
J. Youngs & Son, Norwich	4,113	10	0
G. H. Blyth, Foulsham	3,850	0	0
A. F. Forman, King's Lynn	3,845	3	3
Tash, Langley & Co., King's Lynn	3,828	9	0
Clark & Sons, Cambridge	3,480	0	0
R. Shanks, Chatteris	3,395	0	0

* Accepted conditionally. † Sent in late.

London, W.—For additions and alterations to 42, Avenue Road, Regent's Park, for Mr. Lionel Asprey. Messrs. Thomas Dinwiddy & Sons, architects, 54, Parliament Street, S.W., and Greenwich:—

G. Munday & Son	£1,350
G. R. Shaw	1,328
Kilby & Gayford	1,297
J. B. Cole	1,280
W. Willett	1,248
T. D. Leng	1,158
Pollard & Brand, South Tottenham	1,065

* Accepted.

London.—For the partial reconstruction of the bridges carrying Clerkenwell Road over the Metropolitan Railway; Commercial Street East over the Great Eastern Railway; East India Dock Road over the North London Railway, and High Street, Kingsland, over the North London Railway (Docks line), for the London County Council:—

W. Moss & Sons, Loughborough	£11,925	6	0
Heenan & Froude, Manchester	6,035	2	3
J. Strachan, Cardiff	5,950	0	0
A. Thorne, London	5,830	7	3
Muirhead, Greig & Matthews, London	5,493	9	3
A. Fasey & Son, London	5,416	3	6
G. Hay & Co., London	5,395	9	9
Johnson & Langley, Leicester	5,301	16	6

* Recommended for acceptance.

[Architect's estimate, £5,929.]

London, W.—Recommended for acceptance for the construction of an underground convenience for men only in Foley Street, for the St. Marylebone Borough Council:—

Doulton & Co.	£1,520
---------------	--------

Less amount provided for salary of clerk of works.

London, S.W.—For the erection of a new police-station and stable at Clapham, for the Receiver for the Metropolitan Police District. Mr. J. Dixon Butler, architect and surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son & Chidgey, Charing Cross Chambers, Duke Street, Adelphi, W.C.:—

J. H. Adamson	£13,050
Lawrence & Sons	12,745
Lathey Brothers	12,627
F. G. Minter	12,550
Grover & Son	12,420
Mowlem & Co.	12,390
Holloway Brothers	12,280
F. & H. F. Higgs	12,133
C. Ansell	12,006
Higgs & Hill	11,994
Prestige & Co.	11,777
Appleby & Sons	11,420
Lovatt, Ltd.	10,510

London.—For the supply, delivery and erection of the steelwork required in connection with the second portion of the Greenwich electricity generating station, for the London County Council:—

J. Butler & Co.'s Trustees, Leeds	£57,897	7	7
Head, Wrightson & Co., Thornaby-on-Tees	54,918	6	2
Redpath, Brown & Co., London	54,660	4	8
Thames Ironworks, Shipbuilding and Engineering Co., London	53,139	5	7
Braithwaite & Kirk, West Bromwich	50,275	1	10
J. Westwood & Co., London	49,461	5	6
Clayton, Son & Co., Leeds	47,725	11	2
E. C. & J. Keay, Birmingham	46,490	7	10

* Recommended for acceptance.

[Architect's estimate, £48,180.]

(Continued on page xxxvi.)

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5 O'CLOCK P.M. MONDAY IS THE LATEST TIME FOR RECEIVING "WANT" ADVERTISEMENTS. OFFICE: 63, GREAT NEW STREET, FETTER LANE, E.C.

TENDERS cont. from p. xxxv.

Northfield.—For the erection of a public library at Northfield, for the King's Norton and Northfield Urban District Council. Mr. Ambrose W. Cross, A.M.I.C.E., surveyor, 23, Valentine Road, King's Heath:—

R. M. Hughes	£1,390
G. Huins & Sons, Redditch	1,326
G. Foster, jun., Bournbrook	1,311
T. Johnson	1,294
T. Lond & Sons, Bournbrook	1,290
Dallow & Son, Blackheath	1,245
Giles & Son, Small Heath	1,239
Gowing & Ingram	1,185
T. A. Cole & Son, Selly Oak	1,170
C. Griffiths, Lye, Stourbridge	1,138
G. E. Jackson, Oldbury	1,104
W. Jackson, Lingley	1,091
C. Pegram, Northfield	1,088
H. J. Pitts	1,079
G. E. Cragg, Selly Oak	1,035

* Accepted. [Rest of Birmingham.]

Northingham.—Accepted for the erection of two houses in Derby Road. Messrs. A. R. Calvert & W. R. Gleave, architects, 19, Low Pavement:

W. Crane, Ltd.	£1,193 5 0
Plymouth. —For the erection and completion of a police- and fire-station, at Prince Rock, for the Corporation. Mr. James Paton, borough engineer and surveyor:—	
Dakcham Brothers, Devonport	£1,585 0 0
H. J. Allen, St. Budeaux	1,918 18 0
W. E. Blake	1,918 0 0
W. E. Bennett, Cawsand	1,917 0 0
F. J. Stanbury, Devonport	1,872 14 0
A. Andrews	1,777 0 0
Steel & Pearce	1,750 16 3
A. C. Jones	1,745 0 0
S. Roberts	1,699 17 7
Pearce Brothers	1,668 18 0
A. N. Coles, New Town Chambers, Old Town Street	1,618 0 0

* Accepted subject to confirmation by the Council. [Rest of Plymouth.]

Preston.—Accepted for the reconstruction in stone and concrete of a new bridge between Flixton and Carrington over the River Mersey, for the County Palatines of Lancaster and Chester:—

M. Hawley, Ridgmont, Burstock, Hull

Sheffield.—Accepted for work required in connection with new roofing, outer walls, gateway, &c., at the carsheds, Queen's Road, Sheffield, for the Tramway Committee: (1) excavator, bricklayer, mason, carpenter and joiner, plumber and glazier, slater and painter; (2) iron-founder. Mr. C. Wike, C.E., city surveyor:—

J. Fidler, Ltd., Corporation Street... £2,526 18 6

Coming Events.

Friday, January 5.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. Mowbray A. Green on "The Eighteenth-century Architecture of Bath."

Monday, January 8.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. Percy Scott Worthington on "The Houses of the Monks in the Middle Ages."

Tuesday, January 9.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Sir Charles Cameron on "The Ventilation of Workshops and Dwellings," at 8 p.m.

Wednesday, January 10.

EDINBURGH ARCHITECTURAL ASSOCIATION (Associates' Section).—Mr. Ramsey Traquair on "Tcmbs," at 8 p.m.

Monday, January 15.

SURVEYORS' INSTITUTION.—Ordinary General Meeting at 8 p.m.

Tuesday, January 16.

MANCHESTER SOCIETY OF ARCHITECTS.—Debate at 6.45 p.m.
ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.—Mr. G. Trotman on "Worcester Cathedral," at 7.30 p.m.

Wednesday, January 17.

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. W. T. Oldrieve on "What H.M. Office of Works is doing for Historic Buildings in Scotland," at 8 p.m.
NORTHERN ARCHITECTURAL ASSOCIATION.—Mr. R. G. Hutton on "Jacobean Floral Patterns," at 7.30 p.m.

Friday, January 19.

INSTITUTION OF MECHANICAL ENGINEERS.—Meeting at 8 p.m.
BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Address by Mr. E. C. Middleton.

ARCHITECTURAL ASSOCIATION.—Mr. F. Lynn Jenkins on "The Consideration of Sculpture by Architects," at 7.30 p.m.

Monday, January 22.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. T. T. Rees on "Architects and the Improvement of Cities."
ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Award of Prizes and Studentship. Messrs. J. M. Swan, R.A., Montague Fordham and Walter Gilbert on "Metalwork," at 8 p.m.

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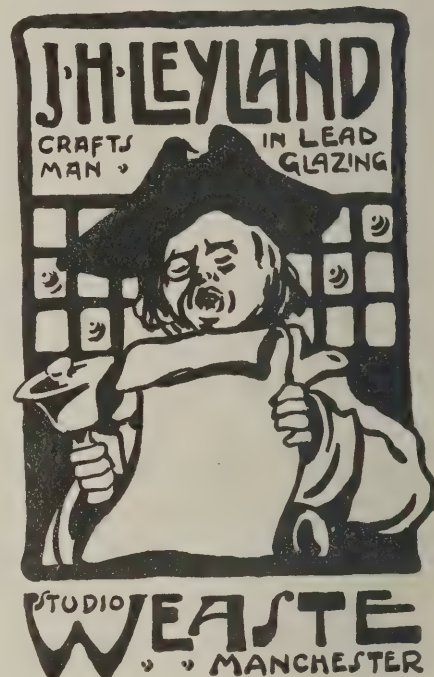
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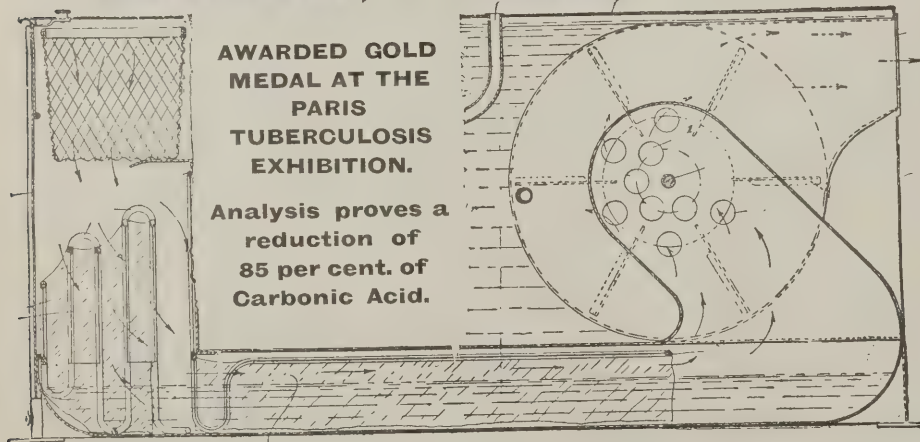
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Bankrupcies.

[Abbreviations: R.O.—receiving order; P.E.—public examination; C.C.—county court; O.R.—official receiver; Ad.—Adjudication.]

R. SHAW, plumber, Darwen. R.O. Dec. 14th.

T. B. LAMB, builder and contractor, Fulwood. R.O. Dec. 15th.

S. W. BRERETON, builder, &c., Liverpool. Liabilities £269; assets nil.

JOHNSON & ROBINSON, builders and contractors, Hesse. Deficiency £542.

J. H. CLAYTON, builder, Loughborough. Liabilities £1,351; assets £680.

HOUSTON & TEAGUE, builders, Morton and Putney. R.O. Nov. 30th.

G. H. WHEELER & Co., builders' merchants, Brighton. R.O. Dec. 13th.

A. H. GOODALL, architect and surveyor, Nottingham. Adj. Dec. 15th.

W. H. MORGAN, builder and contractor, Machen. P.E., Newport Town Hall, Jan. 11th, at 11.

T. S. BRAMHAM, builder and contractor, Leeds. First meeting, O.R.'s, Leeds, Dec. 29th, at 11. P.E., Leeds C.C., Jan. 9th, at 11.

M. THORBURN & SON, plasterers, Burnley. First meeting, Burnley C.C., Dec. 29th, at 11.30. P.E., Burnley C.C., Dec. 29th, at 10.45.

W. URE & SON, builders and contractors, Seaton. First meeting, Cockermouth C.C., Dec. 29th, at 2.45. P.E., Cockermouth C.C., Dec. 29th, at 3.15.

A. J. GARDNER, builder, Teddington (late Twickenham). First meeting, O.R.'s, 14, Bedford Row, W.C., Dec. 29th, at 12. P.E., Brentford Town Hall, Feb. 2nd, at 12.

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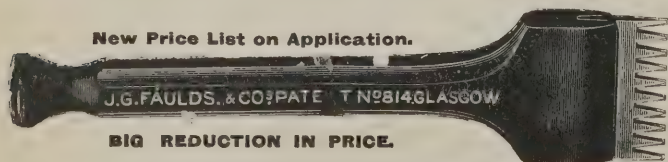
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THE ARCHITECTURAL AND BUILDING EVENTS OF 1905.

GENERAL REVIEW.

IN our architectural world the past twelve months merit particular distinction by reason of the advances made in respect of an organized scheme of education. The importance of this cannot be over-estimated. The Board of Architectural Education has not even yet become an actual living force, but it is on the point of being made so; and the fact that within the past few months a group of eminent architects hitherto outside the Institute for one reason or another have come forward and joined hands with it over this matter of education argues well for the future.

Connected with this subject in more or less degree is the question of registration. Up and down the country the feeling for a definite recognized status has been growing in strength, and the numerous resolutions in favour of registration secured by two travelling apostles—Messrs. Hubbard and Cross—who have read papers on the subject before the leading provincial societies during the year, indicate that although the opinion of architects of eminence who bask in the sunshine of prosperity is certainly not in favour of carrying through any Bill for the Statutory Enrolment of Architects, the growing bulk of opinion is likely to force the adoption of such a Bill, or at least to make an attempt to get it through Parliament. It is necessary, however, to record the fact that the Institute elections this year quite upset the out-and-out registrationists, having practically cleared the council of such adherents.

Of purely professional interest, perhaps no matter has received more general attention than the case of *Gibbon v. Pease*, affecting the ownership of drawings, which was heard in the Court of Appeal in March. According to this decision, the law remains that after the completion of a work and the payment of the architect's fees the building owner can claim the contract drawings, specifications and appurtenant papers: though, when the legal spectacles are taken off, it is clear that such a right is grossly extravagant.

Turning now to buildings which have been proposed, begun and completed during the past year.

In London the new War Office in Whitehall claims first attention. The exterior is now practically complete, and work on the interior is well advanced. The chief front, to Whitehall, with its central columnar treatment and rounded wings, has been disclosed free from its scaffolding, and it will be admitted that the general effect is very good. The centre portion is by far the best, however; it is excellent; but the wings do not group happily with it. Still, Mr. Drury's emblematic groups go far to save the building. In this work the sculptor has followed the feeling of his master—the great

Dalou—and the breadth of effect he has given to these groups merits their inclusion among the best sculpture on London buildings. While referring to this subject it is opportune to note the very different treatment—very effective, nevertheless—which Mr. Pomeroy has adopted in his work at the Central Criminal Court in Old Bailey. Here the sculpture is much flatter; and though the opportunity was not anything like that afforded by the huge Government building in Whitehall, the refined sense of the artist is apparent in every part. This new sessions house, the design of Mr. Mountford, has been brought well on to completion, and work is now far advanced on the great dome.

At the bottom of Whitehall the erection of the huge block for the Local Government Board has been going on quietly, though in the past session of Parliament one facetious member took occasion to ask whether work on the building had stopped, as appeared to the passer-by.

At South Kensington Sir Aston Webb's extension to the museum has progressed so well that the building is now being roofed.

In Newgate Street, on the site of Christ's Hospital, a commencement has been made with the erection of the new post-office designed by Sir Henry Tanner of the Office of Works.

Among other London buildings not connected with Government which have been completed during the year may be mentioned the new Gaiety Hotel in the Strand—certainly a very substantial and on the whole successful effort; the Waldorf and Aldwych Theatres close by; the Scala Theatre, off Tottenham Court Road, where Mr. Verity has made another excursion in design, not perhaps so successful as his Imperial Theatre; Waring & Gillow's new premises in Oxford Street—rich with sculptured ornament, and promising to be a very fine building; and the corner block for the Liverpool and London and Globe Assurance Co. facing the Mansion House (by Mr. Macvicar Anderson—good in general outline but uninteresting in detail).

To the list of London hotels must be added the Ritz in Piccadilly, now almost complete; the Piccadilly, for which St. James's Hall and Restaurant have been demolished; and the Waldorf, behind the Gaiety block: these two last being now at foundation stage only.

In the provinces numerous important buildings have been erected. First may be mentioned the new town hall and law courts in Cathays Park, Cardiff. This is the largest work of its kind in progress, and it has now been so far advanced that the buildings are expected to be completed next summer.

Walsall Town Hall is another notable building of the year, and among other new buildings of this class must be included Deptford Town Hall and Mr. Hare's buildings

at Crewe, both opened in July, and the very fine scheme for Bournemouth prepared by Mr. Lacey and Mr. Mallows, this last scheme having been recently adopted by the town council.

In university and school work there are many interesting buildings to record. The very extensive Royal Naval College at Dartmouth was opened in September—this being one of Sir Aston Webb's most successful buildings: at Cardiff the foundation-stone of the new university buildings designed by Mr. Caröe was laid by the Prince of Wales in June: at Aberdeen the large addition to the university—Marischal College—has been completed so far as the outside is concerned, this being the work of Mr. Marshall Mackenzie: at Sheffield the new university buildings, designed by Mr. E. M. Gibbs, were opened by the King and Queen in July: and at Portishead the Nautical School was completed from Mr. Gabriel's designs.

At Bristol the new art gallery—a fine building—was opened in March; the new Aberdeen Art Gallery in April; and the Municipal School of Art at Hull in October.

A great number of memorials up and down the country have been erected, but many of them are of poor merit. We single out, however, the splendid army memorial at Aldershot, for which Mr. Schultz and Mr. Goscombe John were responsible; Mr. Framp-ton's fine memorial of Queen Victoria which has been erected in front of the town hall at Leeds; the Gladstone memorial in the Strand by Mr. Thornycroft; and Mr. Ingress Bell's South African Memorial Arch at Chatham.

Innumerable libraries throughout the country have been erected during the year. Of these we would specially mention Mr. Hare's at Hammersmith, the new libraries at Glasgow by Mr. Rhind, and the library at Taunton by Mr. Colbourne Little and Mr. Goodison.

Among hospital and similar work we have to record the opening of the new Royal Naval Hospital at Chatham, where some very good work has been done by Mr. Murray, the new Dental Hospital at Birmingham by Messrs. Bateman & Bateman, the Crossley Sanatorium in Cheshire by Mr. Hardisty, the huge new asylum for Middlesex at Napsbury by Messrs. Rowland Plumbe & Harvey, and the Hammersmith Workhouse and Infirmary by Messrs. Giles, Gough & Trollope.

The obituary for 1905 contains the names of many well-known men, notably Mr. Waterhouse, Mr. Blashill, Mr. Mansergh and Lord Grimthorpe.

So far as the building trades are concerned the year has been very dull, but it is hoped that trade has now taken a turn for the better and that next year the building trades will feel the effect of this.



Webster Cottage Hospital, Shanklin, I.W. E. B. T'Anson, Architect.



The Recreation and Dining Hall, Napsbury Asylum.



Seamen's Hospital, Ferry Road, Cardiff. E. W. M. Corbett, Architect.



Napsbury Asylum, Middlesex. Rowland Plumble and Harvey, Architects.



Crossley Sanatorium, Delamere Forest, Cheshire. W. Cecil Hardisty, Architect.



Winsley Sanatorium, Wilts. Silcock and Reay, Architects.



Homes for Epileptic Children, Lingfield, Surrey. T. Phillips Figgis, Architect.

Hospitals, Infirmarys, Sanatoria.

On July 26th His Majesty the King visited Chatham and opened the new Royal Naval Hospital. This building is divided into two main parts: the general hospital, accommodating 468 beds, and the zymotic hospital, accommodating 102 beds—a total of 570 beds. The large wards in the general hospital are 120ft. by 28ft. 6ins. The total cost of the building was about £330,000, exclusive of furnishing. Mr. John C. T. Murray, F.R.I.B.A., was the architect, and Sir Henry Pilkington, R.E., the civil engineer-in-chief; the work having been carried out under the superintendence of Mr. S. P. Brinson, Admiralty architect.

On July 6th Sir Oliver Lodge opened the new dental hospital which has been erected in Great Charles Street, Birmingham, at a cost of £10,000. Messrs. Bateman & Bateman were the architects.

At Cardiff a new seamen's hospital in Ferry Road was erected. The wards are on three floors and provide accommodation for fifty-four beds. The cost has been about £30,000. Mr. E. W. M. Corbett was the architect.

At the Glasgow Western Infirmary a new dispensary was opened about the middle of January, the work having been carried out from designs by Messrs. John Burnet & Son. The general waiting-hall is 86ft. by 31ft., and is seated for more than 400 persons.

In September Princess Henry of Battenberg opened the Arthur Webster memorial cottage hospital which has been presented to Shanklin by Lord Alverstone. It comprises male and female wards, operating theatre, dispensary and offices, and was designed by Mr. E. B. T'Anson.

Winsley Sanatorium, Wilts., was completed from designs by Messrs. Silcock & Reay, of Bath, at a total cost of £10,000. Accommodation is provided for sixty patients.



New Dispensary, Glasgow Western Infirmary.
John Burnet & Son, Architects.



Dispensary, Nottingham.
Ernest & Sutton, Architects.



Convalescent Home for Men, Little Common, Bexhill.
Rowland Plumbe and Harvey, Architects.



Administrative Block, Royal Naval Hospital, Chatham.
John C. T. Murray, F.R.I.B.A., Architect.



Medical School and Nurses' Home, University College Hospital, London.
Paul Waterhouse, Architect.

An isolation hospital at Trowbridge was erected at a cost of £9,150, or £340 per bed (accommodation for thirty patients). Mr. J. Hugh Goodman was the architect.

A new public health laboratory at York Place, Oxford Road, Manchester, was completed at a cost of £13,000. It has grown out of the bacteriological department of the Owens College (now the University of Manchester), and was planned by Professor Delépine.

At the end of May the convalescent home for men at Little Common, Bexhill-on-Sea, was completed, so far as funds permitted. The total cost of the building (exclusive of site) will be about £20,000. Messrs. Rowland Plumbe & Harvey are the architects.

The Crossley sanatorium for consumptives, in Delamere Forest, Cheshire, was opened in the summer. It has been erected at a cost of more than £70,000 from designs by Mr. W. Cecil Hardisty, of Manchester, and comprises twenty-four patients' rooms with single beds, one with two beds, ten wards with four beds and four wards with six beds. The façade of the main building is 300ft. in length.

At Napsbury, near St. Albans, the large county asylum for Middlesex was opened in June. The architects were Messrs. Rowland Plumbe & Harvey. This asylum accommodates 1,150 patients, and the main corridor is altogether about a quarter of a mile long. The total cost has been £385,000. Messrs. Charles Wall, Ltd., of Chelsea, were the builders.



New Dental Hospital, Great Charles Street, Birmingham.
Bateman and Bateman, Architects.



Dentists' Chambers, Cornwall Street, Birmingham.

At Leicester infirmary a new out-patients' block was opened in March. Messrs. Everard & Pick were the architects.

In July the Princess Louise opened new buildings and extensions to the Christian Social Service Union's colony at Lingfield, Surrey, erected from designs by Mr. T. Phillips Figgis, F.R.I.B.A. The colony comprises homes accommodating 100 children, and is the outcome of a movement started a few years ago with the object of removing

epileptic children from the imbecile and senile wards of workhouses and asylums, and providing them with the brighter and more healthful surroundings of the country.

Mr. Paul Waterhouse prepared a design for the new medical school and nurses' home which is to be built in University Street, facing University College Hospital, London, at a cost of £73,000. It is the gift of Sir Donald Currie.



New War Office, Whitehall, London. The late William Young, Architect.

A large new workhouse and infirmary at Wormwood Scrubbs, for the Hammersmith Board of Guardians, was opened by Princess Henry of Battenberg on December 1st. The infirmary accommodates 330 sick persons and the workhouse 428 destitute poor. The cost of the buildings was £207,000, exclusive of £14,400 for the site (about 14½ acres). A feature of the workhouse is the provision of comfortable quarters for aged married couples, which will prevent their separation in the workhouse. The architects for this large scheme were Messrs. Giles, Gough and Trollope, the contractor being Mr. Thomas Rowbotham, of Birmingham.

Government Buildings.

The new War Office in Whitehall, estimated to cost £475,000, was completed so far as the exterior is concerned, and work on the interior is making rapid progress. The frontage to Whitehall measures 250ft., but that to Whitehall Place, at the rear, is 470ft. Notable features of the building are the sculptured groups by Mr. Alfred Drury, A.R.A., emblematic of Peace, War, Victory and Justice. The building was designed by the late William Young, whose work is being carried on by his son, Mr. Clyde Young, in consultation with Sir John Taylor of the Office of Works.

At the bottom of Whitehall the new offices for the Local Government Board were proceeded with and the side facing Parliament Square was carried to its full height; the work, however, is so large that progress appears to the passer-by to be slow.

At one corner of Lincoln's Inn Fields the new Land Registry Office was erected, of red brick with stone dressings.



The New Post-office Building, Newgate Street, London.
Sir Henry Tanner, Architect.

On October 16th the King laid the foundation-stone of the new Post-Office building which is to be erected on two-thirds of the site of Christ's Hospital in Newgate Street, London. The design has been prepared in the Office of Works under the direction of Sir Henry Tanner.

The Victoria and Albert Museum extension in course of erection at South Kensington made considerable advance, and is now being roofed. Sir Aston Webb and Mr. E. Ingress Bell are the architects of this large block of buildings.

New Inland Revenue offices at Cardiff were erected at a cost of £20,000, the architect being Mr. H. N. Hawks, I.S.O., of H.M. Office of Works.

The Building Trades.

Bad though the year 1904 was for the building trades, the past twelve months have been still worse. All branches have felt it, and it is always some time before the building trades feel the effects of an increase in the general trade of the country, which is now, we are glad to state, showing signs of improvement. Bankruptcies of small builders have been fairly numerous. The slackness of trade has been generally referred to at all the meetings of contractors' associations, and it has been a noticeable feature how keen the competition has been in tenders, large firms finding it necessary to go in for comparatively small jobs. It is only those branches of the building trades more closely connected with the engineering industry that have received a fair share of business. In the large towns of course there is always a good deal of work going on, and in London the rebuilding of areas has proceeded apace. There has been a more general adoption of fire-resisting construction in recent years, and during the past year firms connected with this branch of construction have increased in number, while the older firms have extended their business.

Reinforced Concrete.

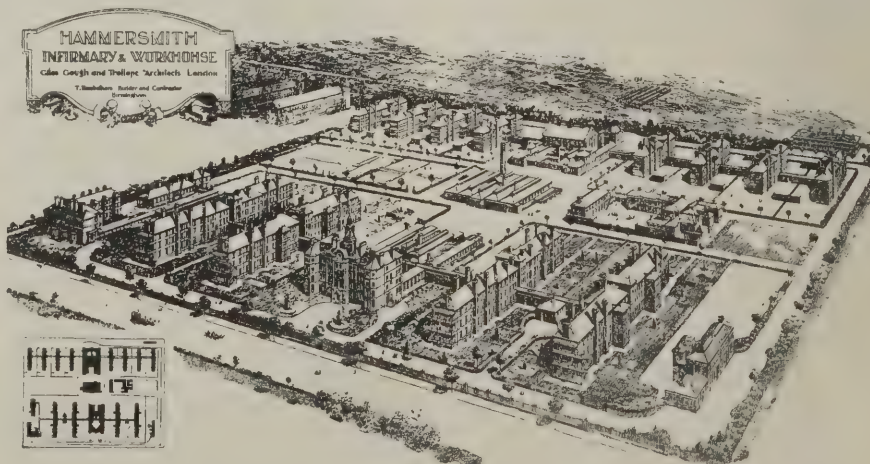
The use of reinforced concrete for all kinds of structural work has been extended in this country during the year, and this form of construction promises to be still more largely adopted in the future.

Building Accidents.

During the past year a number of structural accidents have occurred, many of them, however, not particularly serious. The collapse of two bays of Charing Cross Railway Station roof on December 5th, due to the snapping of a tie-rod, was the most serious. These bays had a span of 164ft. and together were 70ft. long. Immediately after this terrible accident steps were taken to secure the roof against future collapse, but, on the report of the consulting engineers, Sir Benjamin Baker and Sir John Wolfe Barry, it was decided to remove the old roof and substitute one of modern type. A wall at Croydon was weakened in the course of reconstructing the theatre early in December, and fell down. Earlier in the year the upper floor of a two-storeyed building at Burslem used as a tile works collapsed, owing to being overloaded by the storage of tiles. The other accidents were smaller, but all tend to show that more supervision is needed to guard against the effects of decay and overloading.



Administration Building, Hammersmith Workhouse and Infirmary. Giles, Gough and Trollope, Architects.





University College Schools, Hampstead. Arnold Mitchell, Architect.



Scheme for the Rebuilding of King's College Hospital at Camberwell. W. A. Pite, Architect



Epsom Parish Church.
Nicholson and Corlett, Architects.



Lambeth Municipal Buildings. Hall and Warwick, Architects.



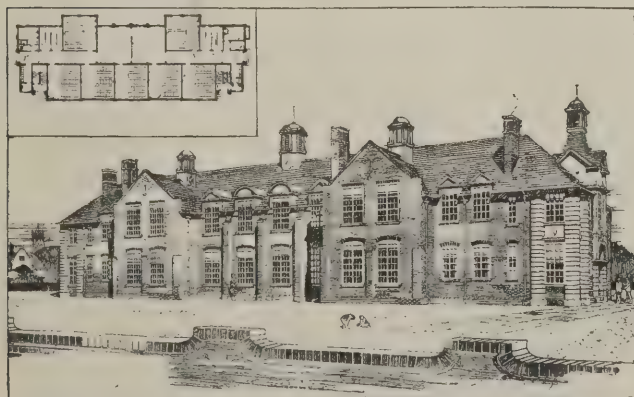
Worthing Public Library. H. A. Crouch, Architect.



Central Library, Islington. Henry T. Hare, Architect.



Public Library, Cheshunt, Herts. J. Myrtle Smith, Architect.



School, Ferndale Road, Swindon. Nicholls and Stockwell, Architects.



Mitchell Library, Glasgow. William B. White, Architect.

COMPETITIONS OF 1905.

Award Announced.	Building.	Cost.	Assessor.	Successful Competitors.	Remarks.
January	Cottage Hospital, Crief	£ 1,400	W. H. Mungall, Civil Engineer, Crief.	Edward C. H. Maidman	14 designs submitted.
"	Parish Church, Elgin	4,000	Congregation	P. Macgregor Chalmers	Limited to 3 selected architects.
"	Converting School Buildings at Norwood into Home for Aged People.	3,950	Works Committee	1st E. C. Beaumont, 2nd W. M. Weir.	
"	University College School, Hampstead.	—	Sir Aston Webb	Arnold Mitchell	Limited to 5 selected architects.
"	Elementary School, Northwich	10,500	H. Beswick (Co. Architect for Cheshire).	A. E. Powles	Limited.
"	Sir Hector Macdonald Memorial, Edinburgh.	—	Sir Rowand Anderson.	1st W. Burnie Rhind, 2nd Edward C. H. Maidman.	
"	Sir Hector Macdonald Memorial, Dingwall.	—	—	1st James S. Kay, 2nd Edward C. H. Maidman	About 160 designs submitted.
February	Carnegie Library, Wardle	1,500	District Council	Butterworth & Duncan	Limited competition.
"	Cottage Hospital, Moffat	1,100	Sydney Mitchell	Edward C. H. Maidman	40 designs submitted.
"	Public Offices, Seacombe, Cheshire	50,000	Sir William Emerson.	1st (250) Briggs & Wolstenholme and Arnold Thornely, 2nd (275) A. R. Jemmett and G. T. M'Combie, 3rd (250) W. H. Ashford	96 designs submitted.
"	Schools in Keynsham Rd., Cheltenham	7,268	Committee	1st Chatters & Smithson, 2nd Healing & Overbury, 3rd H. E. Lavender.	For 750 children.
"	Three Carnegie Libraries, Belfast	12,000	Sir Thomas Drew	Graeme-Watt & Tulloch.	
"	Northumberland War Memorial, Newcastle.	2,000	Hamo Thornycroft	1st T. Eyre Macklin, 2nd (20) C. S. Errington, 3rd (210) F. W. Doyle Jones	41 designs submitted.
"	New Infirmary, Alnwick	—	Frank Caws	1st (210) J. Wightman Douglas & Boyd & Groves, 2nd (250), divided, Stephen Piper & Armstrong & Wright.	Limited to architects practising in Northumberland and Durham.
March	Carnegie Library, Nelson	7,000	G. H. Willoughby	1st (250) W. Brandreth Savidge & J. R. Poyser, 2nd (225) D. Bird & G. Fox, 3rd (215) H. T. Rees.	207 designs submitted.
"	Carnegie Library, Townhill, Dunfermline.	3,500	Carnegie Dunfermline Trust.	1st Peter L. Henderson, 2nd (225) James T. Scrobie, 3rd (215) Henry F. Kerr, 4th (210) Kerr & M'Culloch.	More than 60 designs submitted.
April	Church at New Somerby, Grantham	—	G. H. Fellowes Prynne.	Betram H. Tarrant	104 designs submitted.
"	Shire Hall, Bury St. Edmunds	7,860	Council assisted by Surveyor.	1st (250) Arthur Field, 2nd (230) O. Mahomed & B. H. Tarrant, 3rd (220) Warwick & Hall.	
"	Council School, Accrington	15,000	—	1st (250) Fairhurst & Holt, 2nd (225) Shaw & Vowles, 3rd (210) Sproat & Clayton.	To accommodate 1,000 scholars.
"	Public Library, West Islington	—	John Belcher	Prof. Beresford Pite	Limited.
"	Congregational Church, Crookes, Sheffield.	—	E. M. Gibbs	1st (220) W. J. Hale, 2nd (210) W. T. Campsall.	
"	Council Schools, Preston	8,000	F. W. Catterall	1st (250) H. Howarth, 2nd (230) A. Brocklehurst, 3rd (220) F. Quentery Farmer.	
"	Clock Tower, St. George's Circus, London, S.E.	3,843	Thomson & Pomeroey.	1st J. F. Groll, 2nd Leslie Wilkinson, 3rd Alexander Peacock.	On site of Obelisk. 106 designs submitted.
"	School, Caversham	11,000	G. D. Holman	1st William A. Ashford, 2nd La Trobe & Weston, 3rd G. H. Blatherwick.	
May	Sunday School Centenary Memorial Hall, Stockport.	15,000	A. I. Murgatroyd	Potts, Son & Hennings	16 designs submitted.
"	Carnegie Library, Wrexham	3,500	W. E. Willink	1st (226 ros.) Vernon Hodge, 2nd (215 15s.) Graeme-Watt & Tulloch.	104 designs submitted.
"	Infectious Diseases Hospital, Altrincham.	7,500	Frank Briggs	William Owen	Limited competition.
"	King's College Hospital Rebuilding, Camberwell	400,000	Rowland Plumbe	W. A. Pite	6 architects invited to submit designs.
"	New Vicarage, St. Mary's, Rochdale	1,700	No assessor	Jesse Horsfall	Limited, three competitors.
"	Council School, Richmond, Surrey	10,300	Education Committee.	1st E. J. Milner Allen, 2nd C. Harrison Townsend	To accommodate 500 children.
"	New Cemetery, Wilmslow	4,500	H. Beswick (Co. Architect for Cheshire).	1st (225) W. Longworth, 2nd (215) H. C. Cullock, 3rd (210) C. T. Taylor.	Mr. Taylor's design accepted by urban district council.
"	New Baths and Washhouses, South Shields.	12,000	A. W. S. Cross	J. H. Morton	10 designs submitted.
"	Municipal Buildings, Lambeth	35,000	Henry T. Hare	1st Warwick & Hall, 2nd (220) H. P. Burke Downing, 3rd (200) Crouch, Butler & Savage.	143 competitors.
"	School, Taunton	9,000	Charles Hadfield	1st H. Dare Bryan & F. W. Roberts, 2nd Samson & Cottam, 3rd, Price & Jane.	12 designs submitted.
"	Elementary School, Aylesbury	9,200	T. W. Cutler	1st J. Moir Kennard & H. Kennard, 2nd (225) A. Hendy & John Cash & M. S. Hack (divided).	
"	Boys' School, Buxton	4,000	G. H. Widdowes	1st Charles Swain, 2nd Garlick & Flint, 3rd W. R. Bryden.	
"	Police-court Extension and Fire-brigade Depot, Bristol.	48,000	—	1st (252 ros.) A. Southcombe Parker, 2nd H. Williams	15 designs submitted. Work postponed for three years.
"	Elementary School, Wolverton	7,846	T. W. Cutler	1st Harrington, Ley & Kerkham, 2nd Frank T. Baggallay	820 children.
"	Secondary School, Wolverton	4,218	T. W. Cutler	1st Harrington, Ley & Kerkham, 2nd G. Sedger.	165 scholars.
"	Davie's Memorial Laboratories, Aberystwyth.	20,000	—	Alfred W. S. Cross	Limited competition.
June	Baths and Washhouses, Hammer-smith.	45,000	Committee and Borough Surveyor.	J. Ernest Franck	Limited to 6 selected architects.
"	Public Library, Worthing	15,000	John Belcher	1st (250) H. A. Crouch, 2nd (225) Lanchester & Rickards, 3rd (215) Russell & Cooper, 4th J. O. Gibson.	15 designs submitted.
"	Council Schools in Bournemouth Park Road, Southend-on-Sea.	14,000	Education Committee.	1st Greenhalgh & Brockbank, 2nd G. E. Clare, 3rd D. H. Smith.	Final selection made from 9 designs out of 132 originally submitted.
"	Wesleyan Connexional Hall and Offices, Westminster.	140,000	Sir Aston Webb	Lanchester & Rickards	20 designs submitted. Competition limited to local architects.
"	Twenty Dwelling-houses, High Win-cobank, Sheffield.	2,520	E. M. Gibbs	1st H. L. Paterson, 2nd W. Spencer Smith	49 designs submitted.
"	Carnegie Library, Radcliffe	5,000	G. H. Willoughby	1st (250) H. Lord, 2nd — Adshead, 3rd David Bird	16 designs submitted.
"	Girls' Secondary School, High Wycombe	3,500	—	1st Arthur T. Greenwood, 2nd C. H. Norton, 3rd F. W. Mee	4 designs submitted.
"	Extension, Coventry and Warwick-shire Hospital.	35,000	E. T. Hall	A. Hessel Tiltman and H. W. Chattaway	
"	Primitive Methodist Orphanage Home, Harrogate.	—	F. W. Dixon	1st (225) Oldham & Hill, 2nd (215) Boyd & Groves	36 designs submitted.
"	Three-Department School, Rose Green, Bristol.	—	Education Committee.	Herbert J. Jones & Son	17 designs submitted. School to accommodate 1,190 children.
"	School, Ferndale Road, Swindon	12,500	W. L. Bernard	Nicholls & Stockwell.	
"	Harrogate Infirmary Extension	5,000	G. B. Bulmer	1st (225) H. E. & A. Bown, 2nd (215) Bolshaw & Steevens, 3rd (210) T. E. Marshall.	12 designs submitted by local architects.
"	Central Public Library, Islington	35,000	John Belcher	Henry T. Hare	Limited to 8 selected architects.
"	Welsh C.M. Church, Tretrw	3,500	Committee	G. Dickens-Lewis	Limited competition.
July	Housing Scheme, Guildford	£183 each for eight cottages.	Committee	1st (220) T. J. Capp	2 other competitors.
"	Mitchell Library, Glasgow	44,479	A. B. M'Donald, City Engineer, John Keppie and F. T. Barrett (Librarian).	1st (2100) John Arthur, 2nd (75) Sydney K. Greenslade, 3rd (250) James R. Rhind.	Design by W. B. White accepted. 76 designs submitted.
"	Public Elementary School, Leigh	9,000	Mervyn Macartney	1st J. C. Prestwich, 2nd J. B. Thornley, 3rd Potts, Son & Hennings.	Limited to 14 selected architects.
"	New Charity Schools, Rothbury	3,000	F. W. Rich	1st H. Miller, 2nd J. G. Burrell, 3rd Charles S. Errington, 4th C. Franklin Murphy.	Accommodation for 900 children.
"	Branch Library, Cathays, Cardiff	4,750	H. V. Lanchester	1st (275) Speir & Beavan, 2nd (250) E. M. Bruce Vaughan	20 designs submitted.
"	Branch Library, Canton, Cardiff	4,750	H. V. Lanchester	1st (275) E. M. Bruce Vaughan, 2nd (250) Speir & Beavan	Do.

Competitions of 1905—continued.

Award Announced.	Building.	Cost.	Assessor.	Successful Competitors.	Remarks.
August	Schools, Bexhill - - -	£6,000	A. H. Ryan-Tenison.	1st H. P. Burke Downing, 2nd W. S. A. Gordon, 3rd A. Jessop Hardwick.	106 designs submitted.
"	Baptist Church and Schools, Consett, co. Durham.	3,500	Committee -	George Baines & R. Palmer Baines.	
"	Council School, Stanfree, Bolsover -	1,600	Committee -	Clarence R. Ross.	
"	Council Schools, Langwith Bassett and New Bolsover.	2,000 & 4,000	Committee -	H. Tatham Sudbury.	
Sept.	Technical Institute, Rochester -	—	Frank T. Baggallay	1st Russell & Cooper, 2nd Crouch, Butler & Savage, 3rd W. H. Knowles.	131 designs submitted.
"	Chapel and School, Shearbridge, Bradford.	6,000	W. E. Potts -	1st (£10 ros.) Edgar H. Parkinscn, 2nd A. Sharp -	Limited to four selected Bradford architects.
"	School, Reddish, Stockport -	11,000	J. W. Simpson -	1st Cheers & Smith, 2nd Winder & Taylor, 3rd Adshead & Holt.	
"	Holy Trinity Church, Failsworth, Manchester.	5,000	Frank P. Oakley -	1st Frank Freeman, 2nd H. & W. Wade.	
Oct.	Council School, Derby -	16,750	Committee -	1st (£50) Hunter & Woodhouse, 2nd (£20) T. H. Thorpe.	25 designs submitted.
"	Schools, Byker, Newcastle-on-Tyne -	15,379	Arnold Mitchell -	1st and 2nd (£30) W. H. Knowles, 3rd (£20) Marshall & Tweedy.	
"	New Free Library, West Bromwich -	7,500	Committee -	1st (£50) J. J. Holliday, 2nd (£30) A. G. Latham, 3rd (£20) Crouch, Butler & Savage.	27 designs submitted.
"	Carnegie Library, Burntisland -	3,500	Washington Browne.	William Williamson.	
"	Rebuilding of Epsom Parish Church -	10,000	G. H. Fellowes Prynne.	Nicholson & Corlette - - - -	Limited to 7 selected architects.
"	Windsor and Egham Joint Hospital -	6,000	Windsor and Egham surveyors.	T. Fredk. Pennington.	
"	Drill Hall, Bury, Lancs -	10,000	Jesse Horstall -	1st A. Hopkinson, 2nd G. H. Willoughby.	
Nov.	Schools, Norman Street, Carlisle -	12,000	Walter H. Brierley.	1st (£75) Oliver & Dodgshun, 2nd (£30) F. Lishman, 3rd (£20) J. W. Benwell.	5 designs submitted.
"	Shop Fronts for W. H. Smith & Son -	—	—	J. & J. B. Ednie and James W. Morton, equal, £50 each -	Original prize was £75. £25 added in circumstances.
"	Elementy. School, Shildon, co. Darham	15,677	Committee and their architect, W. Rushworth, F.R.I.B.A.	1st R. Holt, 2nd (£20) F. Rennoldson, 3rd (£10) Vaux & Mark.	Accommodation for 350 infants, 350 girls and 350 boys.
"	Do. Eldon Lane do.	5,538		1st Vaux & Mark, 2nd J. A. Wilson, 3rd R. Holt -	Accommodation for 200 mixed and 150 infants. No premiums.
"	Do. Sedgfield do.	—		1st Hind & Horsbery, 2nd J. H. Morton, 3rd Vaux & Mark	Accommodation for 360 mixed and 180 infants. No premiums.
"	Public Library, Cheshunt, Herts -	2,900	J. S. Gibson -	1st (£45) J. Myrtle Smith, 2nd, E. A. Sudbury, 3rd R. Wylie	Between 70 and 80 competitors.
"	Secondary School for Girls, Preston -	9,000	—	1st (£50) Woolfall & Eccles, 2nd (£30) A. E. Corbett, 3rd (£20) Charles B. Pearson.	37 designs submitted.
"	Municipal Offices, Dartmouth -	10,000	No assessor -	1st (£50) R. Montague Luke, 2nd (£30) Horace T. Bonner, 3rd (£20) Bridgman & Bridgman.	30 competitors.
"	City Hall, Perth - - -	—	J. J. Burnet -	For new hall, 1st (£52 ros.) J. Wallace Archer, 2nd (£31 ros.) Thomson & Robertson, 3rd (£21) Henry & M'Lennan. For reconstruction, 1st (£31 ros.) James Sibbald, 2nd (£21) Menart & Jarvie, 3rd (£10 ros.) Hall Jones & Cummings.	
Dec.	Mirfield Grammar School Extension -	—	—	J. Lane Fox.	



Wesleyan Methodist Hall and Connexional Offices, Westminster.
Lanchester and Rickards, Architects.



Secondary Schools for Girls, Preston. Woolfall and Eccles, Architects.



Davie's Memorial Laboratories, University College, Aberystwith.
Alfred W. S. Cross, Architect.



Public Offices, Seacombe, Cheshire.
Briggs and Wolstenholme and Arnold Thornely, Architects.



Woodside Public Library, St. George's Road, Glasgow.
J. R. Rhind, Architect.



Dunfermline Baths.



Crosshill and Govanhill District Library, Glasgow. J. R. Rhind, Architect.
Photo: T. M. W. Organ.



Dunfermline Baths: The Gymnasium.



Carnegie Library, Hull. Joseph H. Hirst, City Architect.



The Pond Hall.
New Carnegie Baths, Pilmuir Street, Dunfermline.
Hippolyte J. Blanc, Architect.

Libraries.

The new central library at Hammersmith was completed and opened by the Duke of Argyll on July 24th. This is the gift of Mr. Andrew Carnegie, and has cost £14,500. The architect was Mr. Henry T. Hare, whose design was selected in a limited competition.

A new public library at West Derby, Liverpool, was built at a cost of £15,700 from designs prepared by the Corporation architect and surveyor, Mr. T. Shelmerdine.

At Hull the Carnegie branch library in the West Park was completed from designs by the city architect, Mr. Joseph H. Hirst.

At Taunton the new free library opposite the municipal buildings was erected. Messrs. A. T. Colbourne Little and Ingleson C. Goodison were the architects.

Two new libraries at Glasgow, the Woodside library and the Crosshill and Govanhill district library, were completed from designs by Mr. J. R. Rhind.



Harrogate Public Library.
Henry T. Hare, Architect.

At the beginning of October the foundation-stone of a public library at Southend-on-Sea, to which Mr. Carnegie contributed £8,000, was laid. Mr. Henry T. Hare is the architect.

A new central library at Greenwich was erected at a cost of about £10,000 from designs by Mr. Sydney R. J. Smith, F.R.I.B.A. It was opened at the beginning of November.

A free library was built at Eastbourne from designs by Mr. Philip A. Robson, A.R.I.B.A.

Baths.

New Carnegie baths at Dunfermline were opened in April. The buildings have been designed by Mr. Hippolyte J. Blanc, R.S.A., and comprise swimming baths and other baths, and a gymnasium 103ft. by 45ft. The cost has been about £36,000. It is interesting to note that there are two paths around the main swimming bath—one for bathers and

the other for those going to and from the dressing-boxes.

New public baths at Camberwell, including Turkish baths, were opened in October. Mr. E. Harding Payne, A.R.I.B.A., was the architect.

New public baths at Hull were completed on a site at the corner of Beverley Road and Epworth Street. There are three swimming baths, forty-eight slipper baths, and spray baths, these last being a new feature for Hull. The building and engineering work was designed by the city engineer, Mr. A. E. White, M.I.C.E. The cost, including fittings, was £25,000.

At Bradford new district baths were opened on July 19th, serving the township of Bowling. In September the new central baths in Morley Street were opened. These latter were designed by Mr. A. Hessel Tiltman, of London, with certain modifications made by the city architect, Mr. F. E. P. Edwards. The cost of the central baths was about £30,000.

Law Courts, Fire-stations, Crematoria, Workmen's Dwellings, &c.

At the end of January the foundation-stones of the new quarter-sessions court, police buildings and fire-station at Sunderland were laid. This building is being erected from designs by Messrs. Wills & Anderson, of London, and Messrs. W. & T. R. Milburn, of Sunderland, and is likely to cost £40,000.

In Old Bailey the central criminal court has made rapid progress during the past year, so that at the present time the work on the great central dome is almost completed. Mr. E. W. Mountford, F.R.I.B.A., is the architect, Mr. Pomeroy is executing the decorative sculpture, and Sir William Richmond and Professor Moira will paint some lunettes inside. The building will be opened in November next year. Its cost is likely to be nearly £300,000.

The Tower Bridge Police Court was completed in March. This was erected from designs by Mr. J. Dixon Butler, and together with the adjoining police-station (opened last year) cost £45,000. The site cost £19,000.

The erection of Manchester's new chief fire-station on a site bounded by London Road, Whitworth Street, Fairfield Street and Minshall Street has been satisfactorily progressed with during the year. The estimated cost of the building is £85,000. Messrs. Woodhouse & Willoughby are the architects.

A new fire-station for the London County Council was erected at Kensington from designs by Mr. W. E. Riley, superintending architect.

A new fire-station at Ilford was erected at

a cost of £9,000 from designs by Mr. H. Shaw, A.M.I.C.E., surveyor to the council.

A crematorium at Bradford was opened at the end of July. There are 125 niches for urns. The cost of the building has been about £5,000. The furnace is by Fradet, of Paris, and is similar to the one at Leeds, these being the only two gas-heated furnaces in this country.

At Sheffield the Corporation crematorium was opened on April 5th. The building was designed by Messrs. C. & C. M. Hadfield.

In Bride Road, Dublin, a new block of workmen's dwellings with a plan like the letter **W** was erected from designs by Messrs. Joseph A. Smithden, of London, under the supervision of Messrs. Kaye Parry & Ross, of Dublin. There are 516 cubicles on the four floors above the ground storey.

The building of the new tramway offices in Hatton Garden, Liverpool, to which they have a frontage of 184ft., was proceeded with. The work is to cost nearly £50,000, and is being carried out from designs by Mr. Thomas Sheldermine, the Corporation architect and surveyor.

New car building and repair works for the Manchester Corporation were erected in Hyde Road from designs by Mr. John Gibbons, F.R.I.B.A., of Manchester.

New market buildings at Wellingborough, built at a cost of £12,000, were opened on November 1st.

A new central hall at Eccles was built at a cost of £3,000 from designs by Mr. Edward Hewitt, A.R.I.B.A., of Manchester.

Art Galleries and Schools of Art.

The new art gallery at Bristol, presented to the city by Sir W. H. Wills, was opened in March by Professor Herkomer. It adjoins the museum. Mr. Frank W. Wills, of Bristol, and Messrs. Houston & Houston, of London, were the joint architects.

The Aberdeen Art Gallery was opened in April by Sir George Reid. It is the outcome of a desire for a thorough teaching collection of casts arranged to show the history of sculpture from the Egyptian period. The total cost was £35,000, and the architects were Messrs. A. Marshall Mackenzie & Son.

The Municipal School of Art at Hull was opened on October 6th. The building has cost more than £20,000. Messrs. Lanchester & Rickards were the architects, their design having been selected in competition. The carving over the principal entrance has been done by Mr. Fehr, and the glass mosaic panel in the pediment beneath the roof by the Bromsgrove Guild of Handicraft, designed by Mr. Garth Jones.

The City School of Art at Bradford was opened on September 29th by the Marquis of Londonderry. Mr. F. E. P. Edwards, city architect, designed the building.



The Central Criminal Court, Old Bailey, London.
E. W. Mountford, Architect.



New Police Court, Tower Bridge, London.
J. Dixon Butler, Architect.



Crematorium, City Road Cemetery, Sheffield.
C. and C. M. Hadfield, Architects.



New Art Gallery, Bristol.
F. W. Wills and Houston & Houston, Joint Architects.



New Central Police Station, Hull. Joseph H. Hirst, City Architect.



The Gladstone Memorial in the Strand, London.
Hamo Thornycroft, R.A., Sculptor.



The Liverpool Memorial to Men of the King's Own
Regiment. W. Goscombe John, A.R.A., Sculptor.



Engineers' Memorial Arch, Chatham.
E. Ingress Bell, Architect.



Queen Victoria Memorial, Guildhall, York.
G. W. Milburn, Sculptor.



Royal Army Medical Corps' South African Memorial, Aldershot.
R. Weir Schultz, Architect. W. Goscombe John, A.R.A., Sculptor.

Memorials.

In front of Buckingham Palace the new gates and piers in connection with the national memorial to Queen Victoria were placed in position and the widened Mall was brought on from the Duke of York's steps to the Admiralty.

The Gladstone monument in the Strand, just westwards of the church of St. Clement Danes, was unveiled by Mr. John Morley on November 4th. Mr. Hamo Thornycroft, R.A., was the sculptor, assisted by Mr. John Lee, A.R.I.B.A., for the architectural portions of the work.

The Royal Engineers' South African Memorial at Chatham, in the form of an arch standing in the square formed between the Brompton Barracks and the Royal Engineers' Institute, was unveiled by His Majesty the King in July. The architect was Mr. E. Ingress Bell, F.R.I.B.A., and the builders were Messrs. Longley & Co. The arch is carried out in Portland stone and has a series of sculptured panels by Mr. W. S. Frith.

The Leeds memorial to Queen Victoria, in front of the town hall, was unveiled on November 27th. It consists of a bronze seated figure of the late Queen on a stone pedestal, and cost nearly £8,000. Mr. G. J. Frampton, R.A., was the sculptor.

The memorial statue to Queen Victoria at Nottingham, by Mr. Albert Toft, was unveiled at the end of July.

On July 29th Princess Alexandra of Teck laid the foundation-stone of the South African memorial buildings at Eton College. There is to be a school hall 140ft. by 55ft. and 45ft. high, an octagonal library of about 55ft. diameter, and a classical museum. Mr. L. K. Hall and Mr. Sydney K. Greenslade are the architects of the building, which is estimated to cost £40,000.

At Aldershot the splendid South African memorial erected by the Royal Army Medical Corps was unveiled by the King on May 24th. The architectural portion of the memorial was designed by Mr. R. Weir Schultz, and the sculptor work carried out by Mr. W. Goscombe John, A.R.A. The central group is of bronze, and the screen and pedestal of are grey Cornish granite.

At Liverpool the memorial to men of the King's Own Regiment, in St. John's Gardens, was unveiled by Sir George White on September 9th. There is a central figure of Britannia cast in bronze on a granite pedestal, with figures around. Mr. Goscombe John, A.R.A., was the sculptor.

At Birkenhead a memorial to Queen Victoria, in the form of an Eleanor cross, was unveiled in October. Mr. Edmund Kirby, F.R.I.B.A., was the architect.

On September 30th the Duchess of Argyll unveiled at Blackburn a marble statue of Queen Victoria by Mr. Bertram McKennal. It weighs nine tons.

A South African war memorial at Gateshead, in Saltwell Park, was unveiled by Sir John French in November. It was designed by Mr. F. Doyle Jones, of Hartlepool and Chelsea.

A memorial statue to Queen Victoria at York, in white marble, was unveiled by Princess Henry of Battenberg at the end of October. It is placed in the Guildhall, and is the work of Mr. G. W. Milburn, of York.



Model of Queen Victoria Memorial, Calcutta. Sir William Emerson, Architect.

A model of the huge building to be erected in Calcutta to the memory of Queen Victoria was completed, and exhibited at the Academy by Sir William Emerson, the architect for the work: a very large coloured perspective of the building was also exhibited.

Mr. Brock's bronze statue of Millais in front of the Tate Gallery, London, was unveiled on November 22nd.

Universities, Colleges and Schools.

The new university buildings at Sheffield were opened by the King and Queen on July 11th. They form three sides of a quadrangle. The building on the south side, facing the Western Bank, contains the large hall of the university, the building on the west accommodates the faculties of arts and pure science, and the building on the north the medical faculty. Mr. E. M. Gibbs was the architect.

At Cardiff the foundation-stone of the new buildings of the University College of South Wales and Monmouthshire was laid by the Prince of Wales in June. The scheme will involve a total cost of nearly £300,000. Mr. W. D. Caröe is the architect.

Work was carried on continuously at the extension to Aberdeen University—Marischal College—and by the end of the year the scaffolding was taken down from the main front. Work inside is well advanced and is expected to be finished by next autumn.

The college has a frontage of 400ft., including the new Greyfriars Church (which is really a part of the scheme), and is likely to cost £55,000. Mr. A. Marshall Mackenzie is the architect.

The new Royal Naval College at Dartmouth was opened on September 15th. It has been erected at a cost of £300,000, and will accommodate 400 cadets. The south front is 800ft. long. Sir Aston Webb was the architect.

On June 20th the foundation-stone of the new Western Theological College at Bristol was laid. This building is to cost £12,000, and occupies a site opposite Highbury Chapel. The architect is Mr. H. Dare Bryan, F.R.I.B.A.

A new wing at St. Edmund's College, Ware, was opened on May 24th. This addition cost £17,000, and was designed by Mr. F. A. Walters.

A new central higher grade school in Frederick Street, Aberdeen, with a total accommodation for 1,129 scholars, was erected at a cost of £18,000. Mr. J. A. O. Allan was the architect. A good part of the roof is flat and is used as a playground. Mechanical ventilation on the "plenum" system is adopted.

New schools at Gillingham, Kent, were erected at a total cost of £9,800 from designs by Mr. J. Hatchard Smith, F.R.I.B.A.

New council schools at Ealing, in Little Ealing Lane, were erected from designs by Messrs. Greenaway & Newberry, Westminster.

The nautical school at Portishead was completed from designs by Mr. Edward Gabriel, of London.

Extensions were made to the Leeds Grammar School at a cost of £20,000 from designs by Messrs. Austin & Paley, of Lancaster.

A new wing to St. Peter's School, York, was opened in June. The work was carried out from designs by Mr. Walter H. Brierley.

The foundation-stone of the new Royal Grammar School in Brandling Fields, Newcastle-on-Tyne, was laid on September 28th. Messrs. Russell & Cooper, of London, are the architects. The contract amounts to nearly £22,000.

A new grammar school at Marlborough was opened on September 6th. Messrs. Silcock & Reay were the architects.

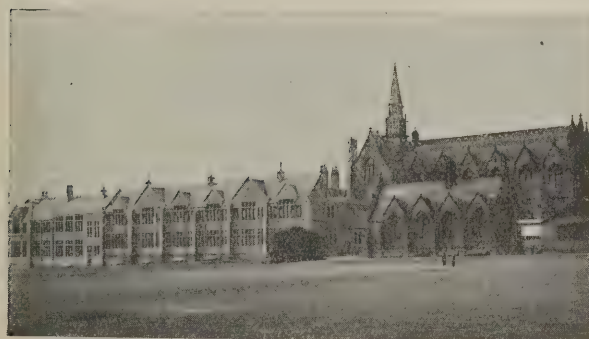
Very satisfactory progress was made with the erection of the new technical college at Glasgow. Up to date the total expenditure has been about £170,000.



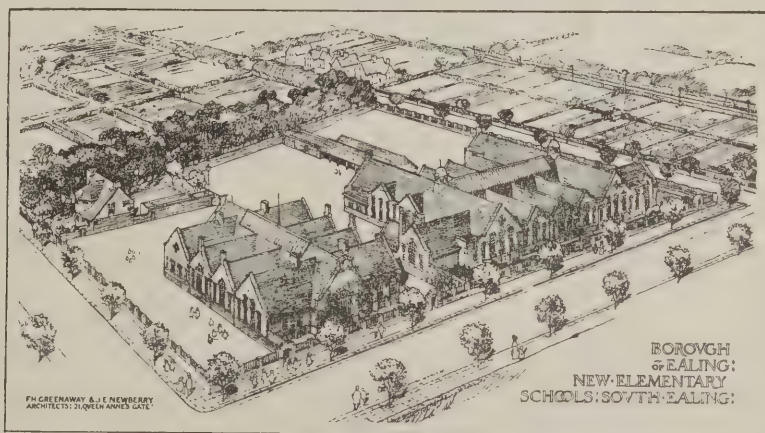
The New Naval College at Dartmouth. Sir Aston Webb, Architect.



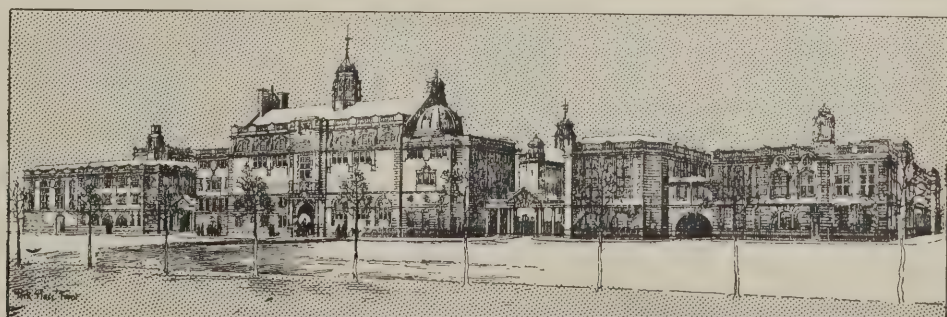
Council Schools, Gillingham, Kent. J. Hatchard Smith, Architect.



Leeds Grammar School Extension. Austin and Paley, Architects.



Central Higher Grade School, Aberdeen. J. A. O. Allan, Architect.



South Wales and Monmouthshire University Buildings, Cardiff. W. D. Caröe, Architect.



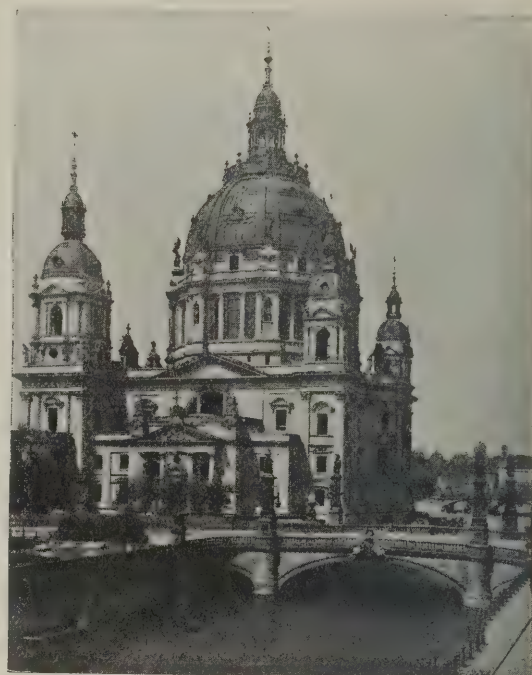
The New Houses of Parliament, Stockholm. A. Johansson, Architect.



Main Facade with Monumental Entrance, Liege Exhibition.
Hasse and Soubre, Architects.



New Law Courts, Rome. Signor Calderini, Architect.



The New Cathedral at Berlin. Raschdorff, Architect.



The New City Hall at Cape Town.
Reid and Green, Architects.

SOME WORK ABROAD.

A new technical institute is being erected in College Square East, Belfast, from designs by Mr. Samuel Stevenson, and is expected to be finished by next June.

The work of erecting new elementary schools at Redhill, for the borough of Reigate, was carried on. Mr. John Moir Kennard, of London, is the architect, his design having been selected in competition.

New council schools in Llanishen Street, Cardiff, were completed at a total cost of £15,000. Messrs. Veall & Sant were the architects. Accommodation is provided for 400 boys, 400 girls and 400 infants.

A council school in Cowper Street, Leeds, accommodating 1,520 children, was opened in November. The cost was £31,200, Mr. Philip A. Robson being the architect.

New premises for the Working Men's College at Camden Town were built at a cost of £22,000 from designs by Mr. W. D. Caroe.

In October the foundation-stone of the new school in Dacre Road, Richmond (Surrey), was laid. The architect is Mr. E. J. Milner Allen, his design having been selected in competition. Messrs. Soole & Son are the builders, their contract being for £10,300.

At the South-Eastern College at Ramsgate, in October, the Archbishop of Canterbury

dedicated the John Deacon Memorial Tower. Mr. T. B. Whinney and Mr. W. Stock were the architects.

A new museum and zoology laboratories of Liverpool University, in Brownlow Street, were opened by the Earl of Onslow on November 18th. They cost £18,000. Messrs. Willink & Thicknesse were the architects.

New Buildings on the Continent and Abroad.

The new cathedral at Berlin was dedicated at the end of February, having been ten years building. It has cost £500,000 and represents the first Protestant Dom in modern Germany. The architect was Herr Raschdorff. The cathedral has a central cupola with cross reaching to a height of about 374ft.—which is nearly 79ft. less than St. Peter's, Rome, and more than 9ft. higher than St. Paul's. The total length of the building is 374ft. and the width nearly 80ft.

The houses of parliament at Stockholm were opened at the commencement of the year.

At Constantinople the British Hospital, designed by Mr. H. Percy Adams, F.R.I.B.A., was opened in January. The building has cost about £35,000 and accommodates fifty patients. It is built mainly of stone from Sevastopol, though Messrs. Doulton, of Lambeth, supplied much of the material for the building.

The huge new Catholic cathedral of St. Mary at Sydney, New South Wales, was dedicated in October. This building has cost £200,000.

The new façade to Naples Cathedral was completed. The total cost was £260,000.

At Rome the erection of the huge new law courts and the memorial to Victor Emmanuel was continued, though progress on both seems slow. The law courts, which face the Ponte Umberto I., were begun in 1889 and are estimated to cost £1,316,000, while the memorial, on the Capitoline Hill, was begun in 1885 and the cost down to the end of last year had been £750,000. Count Sacconi, the architect of the memorial, died in September, and three Italian architects, Piacentini, Koch and Manfredi, were appointed to carry on his work, which is still far from completion.

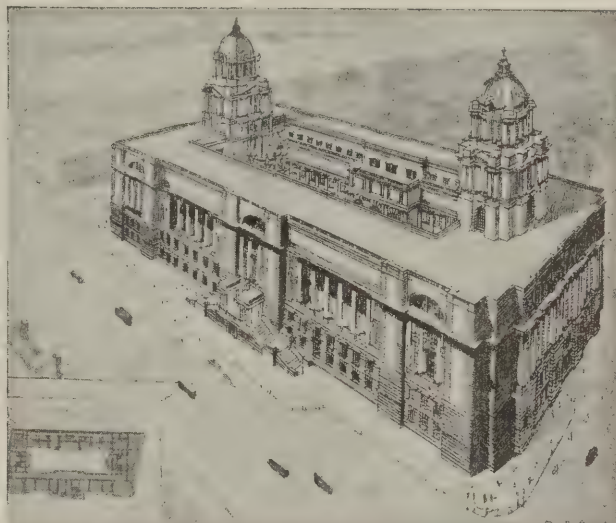
Cape Town's new municipal buildings were opened in August.

The new foundations for the rebuilding of St. Mark's Campanile at Venice were completed, these being carried on 3,076 larch piles and bonded into the old work which forms a nucleus in the centre.

A new theatre at Vienna, the Bürger-theater, was opened in December. The cost of the building was £79,000.



"Courier" Building, Dundee. Niven and Wigglesworth, Architects.



Scheme of New Buildings for Faculties of Arts and Fine Arts, Liverpool University. Charles H. Reilly, Architect.



Billiard-room and Stables, Lynlhurst, Steatham Park. H. P. Burke-Downing, Architect.



The Choir Schoolhouse, New College, Oxford. Nicholson and Corlette, Architects.



Oak Drawing-room, Powis Castle. G. F. Bodley, R.A., Architect.



Central Fire-station, Manchester. Woodhouse, Willoughby and Langham, Architects.



House at Tidenham, Glos. Norman Evill, Architect.



New Loggia and Central Bay, Welbeck Abbey. Ernest George and Yeates, Architects.

HOUSE AT DENBIGH
 FOR G. FRANCIS ESQ.
 BY E. GUY DAWBER ARCHT.



House near Haslemere. E. J. May, Architect.



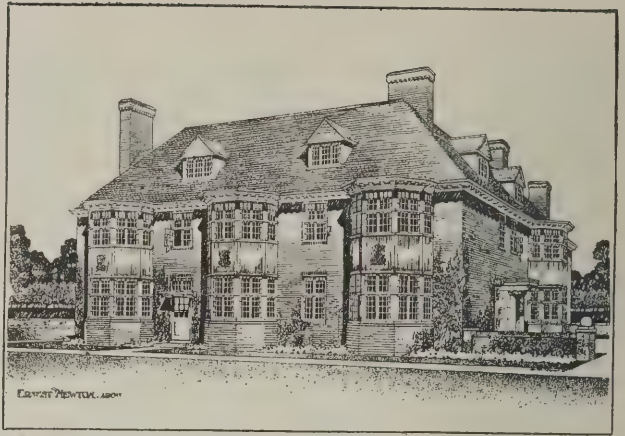
House at Newmarket. A. N. Prentice, Architect.



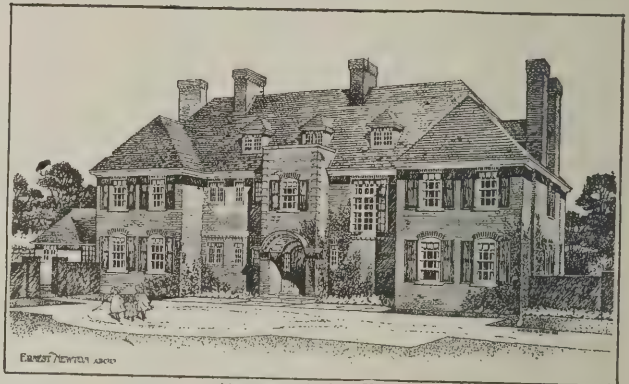
So'om's Court, Surrey. E. Guy Dawber, Architect.



House near Dublin. W. D. Caröe, Architect.



Proposed House at Reigate.



House at Bickley, Kent.



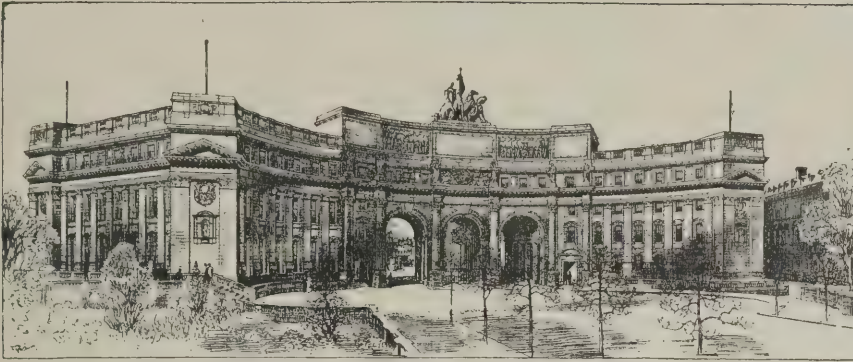
"Brackencliffe," Scarborough. Walter H. Brierley, Architect.



"Summerfield," Abingdon-on-Thames. Harry Redfern, Architect.



Dog and Doublet Inn and New Cottages, Sandon, Staffs.
 E. Guy Dawber, Architect.



Proposed New Building at the End of the Mall, London. Sir Aston Webb, Architect.



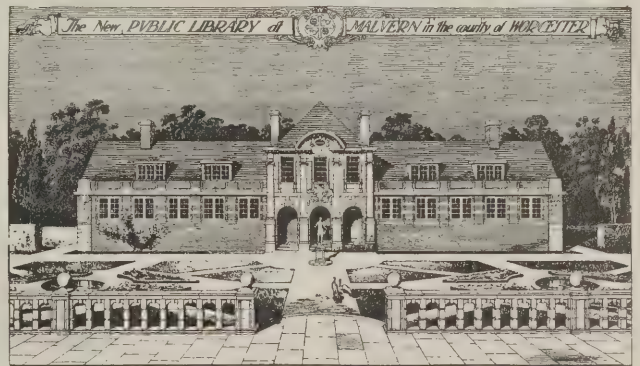
Design for Whitehaven Free Library. H. V. Ashley and Winton Newman, Architects.



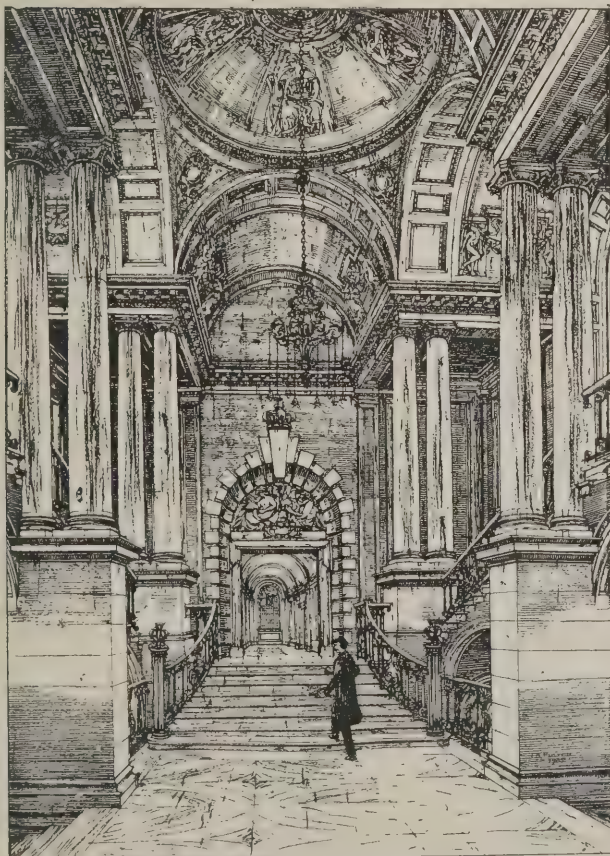
Church at Springfield, Wolverhampton. C. R. Ashbee, Architect.



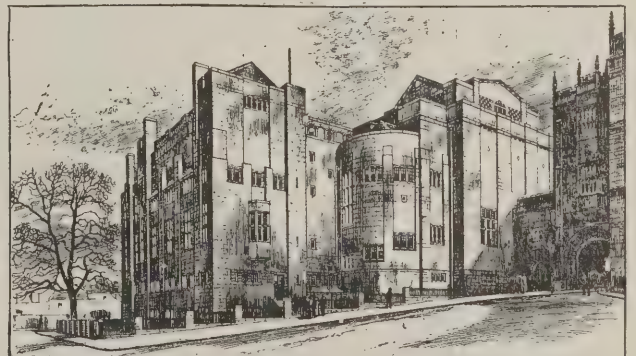
The Western Theological College, Bristol. H. Dare Bryan, Architect.



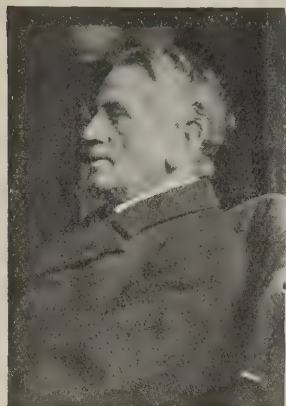
H. A. Crouch, Architect.



Grand Staircase, Municipal Buildings, Walsall. J. S. Gibson, Architect.



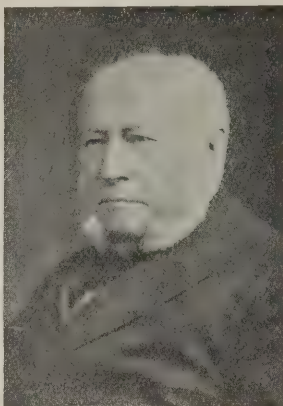
New Central Reference Library, Deanery Road, Bristol. H. Percy Adams, Architect.



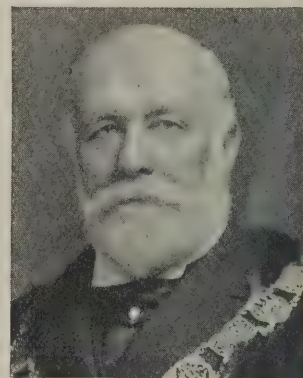
John Leaning.



Frank Caws, F.R.I.B.A.



T. E. Knightley, F.R.I.B.A.



Thomas Blashill, F.R.I.B.A.

Obituary.

On August 22nd Mr. Alfred Waterhouse, R.A., died at his house at Yattendon, Berkshire. He was practically the last of the great Gothic Revivalists, and designed many important buildings. Chief among these is the Manchester Town Hall (remarkable for its planning), the Natural History Museum at South Kensington, the huge block of the Prudential Assurance Co. on Holborn, college work at Oxford and Cambridge, the National Liberal Club, Eaton Hall, Chester, and many other private houses and public buildings throughout the country. Mr. Waterhouse was 75 years of age.

Mr. Thomas Blashill, F.R.I.B.A., died on January 20th, aged 74, after a very brief illness. He was best known as having been superintending architect to the London County Council, in which capacity he was responsible for the erection of many important buildings in the Metropolis, including blocks of working-class dwellings on the Boundary Street area at Shoreditch, and other similar blocks at Millbank which have been carried out by his successor, Mr. W. E. Riley.

Mr. Frank Caws, F.R.I.B.A., of Sunderland, died in April, after an attack of pneumonia. He was in his sixtieth year. Besides being an architect of ability, he excelled in mathematics. For two years in succession he was president of the Northern Architectural Association. One of his designs was a pier at Seaview, and another a suspension bridge on the Wear at Stanhope, in both of which designs a novel principle was adopted so as to resist wind-pressure and give rigidity.

Lord Grimthorpe died in May. He was, of course, known to architects chiefly for his restoration of St. Albans Cathedral, and also as the designer of Big Ben.

Mr. James Thomson, F.R.I.B.A., I.A., of Messrs. Baird & Thomson, architects, Glasgow, died in February. He was born in 1835.

Mr. Charles Forster Hayward, F.R.I.B.A., architect and district surveyor, London, died on July 5th in his 75th year.

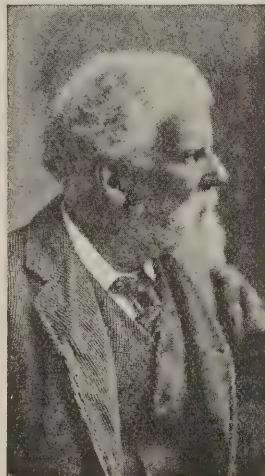
Mr. T. Denville Barry, well-known in Liverpool, died in March, in his ninetieth year. He was an architect of the Gothic Revival school.

M. S. J. Nicholl, A.R.I.B.A., died on March 21st in London, aged 78. He was a Catholic architect of ability.

Mr. John Leaning, the well-known London quantity surveyor, and author of the standard work on quantity surveying, as well as of other books of a similar nature, died in February, aged 65, following upon an operation for appendicitis.



Lord Grimthorpe.



Alfred Waterhouse, R.A., F.R.I.B.A.

Mr. James Mansergh, the well-known civil engineer, died in June, aged 71. He was much connected with railway and water works, and his great scheme for the conveyance of water from the Elan Valley (in Wales), to Birmingham was brought to a successful conclusion last year, when the King opened the works.

Mr. Joseph Wood, F.R.I.B.A., died on June 27th. He carried out a great deal of work at Bristol.

Mr. Cuthbert Brodrick died suddenly in March from pneumonia at his residence in Jersey, aged 83. His chief work was the Leeds Town Hall, which is still recognized as a very fine building.

Mr. A. W. Mills, architect of the Manchester Exchange, the London Road Station and other buildings at Manchester, died on November 22nd, aged 92.

Mr. David Ross, M.I.C.E., formerly engineer to the Corporation of the City of London, died in November, aged 60.

Mr. T. E. Knightley, F.R.I.B.A., of London, died in September, aged 82. He was the architect of the Queen's Hall and the Birkbeck Bank.

Mr. H. H. Collins, F.R.I.B.A., of London, died on December 13th in his seventy-third year. He built a number of City offices and warehouses and was district surveyor for the eastern division of the City.

Mr. Moss Settle, A.R.I.B.A., of Barrow and Ulverston, died on December 13th, aged 29.

Mr. H. H. Armstead, R.A., the well-known sculptor, died in December, aged 79. His two most important works were the sculptured decorations on the Colonial Office in Whitehall and the southern and eastern sides of the podium of the Albert Memorial. He also did the marble reredos in Westminster Abbey and the fountain in front of King's College, Cambridge. "His work had monumental character and simplicity, and will always be remembered as belonging to the front rank of British sculpture."

Colonel Bird, one of the founders of the London Institute of Builders, died in April.

Board of Architectural Education.

The new Board of Architectural Education, after long deliberation, issued a report which was approved by the council of the Institute and by the educational bodies interested, and the co-ordination of the work in the various universities and leading schools throughout the country is now agreed upon. The scheme has not yet come into actual operation, but when it does it is thought that the Board's certificate will form a very valuable asset in the portfolio of the rising architect.

Report of the Lightning Research Committee.

The report of the Lightning Research Committee was issued in May. The committee summarized in it their four years' work, and included suggestions and results based on reports of damaged buildings in 115 cases of lightning stroke; forty of these buildings were provided with lightning rods. The various cases noted by the committee show that while even a single conductor tends to diminish the damage done to buildings by lightning, no reliance can be placed on the area of protection.

New Theory about Masonry Dams.

A new theory about masonry dams was put forward in March by Mr. Atherley and Mr. Pearson, both of University College, London. Briefly stated, the theory is that vertical sections of a dam under water-pressure are more severely strained than the horizontal sections, and that while a dam designed under the rules hitherto applied may be safe as regards cracking horizontally, it may nevertheless be liable to do so vertically.



All Saints' Church (Perceval Memorial), Ealing.
William A. Pite, Architect.



The Church of St. Chad, Longsdon, Staffs. Gerald C. Horsley, Architect.



New Chancel, Downside Abbey, Bath. Thomas Garner, Architect.

Churches.

The Bishop Walsham How Memorial at Wakefield Cathedral, consisting of an addition to the choir, designed by the late Mr. Pearson, R.A., and completed under the superintendence of his son, Mr. Frank Pearson, was consecrated on Easter Tuesday. The total cost was £50,000.

The new choir and chancel of Downside Abbey, near Bath, were blessed on September 18th. The work has been carried out from designs by Mr. Thomas Garner at a cost of nearly £17,000 by local masons working under Dom Philip Whiteside, Procurator and Bursar of the Abbey.

The church of St. Erkenwald at Southend was dedicated at the end of September. It accommodates 800 worshippers, and when complete will have cost £15,000. The tower, however, has not yet been built. Mr. Walter J. Tapper is the architect.

At Ealing Common the new church of All Saints was erected to the memory of the Right Hon. Spencer Perceval, Prime Minister of England, who was assassinated on leaving the House of Commons in 1812. The church was consecrated by the Bishop of London in November. Mr. W. A. Pite, F.R.I.B.A., was the architect.

At St. John's Church, Wakefield (built in the last decade of the eighteenth century), the work of rearrangement and adaptation to modern use, begun in 1884, was carried on, under the direction of Mr. J. T. Mickethwaite, and the new chancel is to be consecrated to-day.

The Church of St. Chad at Longsdon, Staffs., was completed in September and consecrated by the Bishop of Lichfield on October 5th. It is situated about two miles from Leek, in North Staffordshire, and is built of local stone. Mr. Gerald C. Horsley, of London, was the architect.

The Savoy Chapel was re-decorated and lightened inside by order of the King. The work was done by Messrs. Clayton & Bell.



New Chancel and Choir, Downside Abbey.



New Chancel, Chapel and Vestries, St. John's Church,
Richmond, Surrey. Arthur Grove, Architect.

Cockington Church, near Torquay, was completed from designs by Messrs. Nicholson & Corlette, according to whose designs also the additions at All Souls' Church, Loudoun Road, Hampstead, were erected. St. Alban's Church, Southend, was also completed from their designs.

At St. Michael's Church, Headingley, Leeds, a new reredos by Mr. Temple Moore was dedicated on December 14th.

Beth Hamedrash—primarily intended for the study of Holy Law, but actually the Jewish ecclesiastical court—was opened in December. It is in Mulberry Street, Commercial Road, London, E.

On November 11th the Bishop of Ripon consecrated the new Church of the Holy Spirit at Beeston Hill, Leeds, built from designs by Mr. Prothero at a cost of £11,000.

All Saints' Church, Hertford, was completed. The total cost, including the portion carried out in 1893, was £28,000. Messrs. Austin & Paley were the architects.

A Jesuit Fathers' Church at Wimbledon was built at a cost of £6,500. Mr. F. A. Walters was the architect.

New buildings at Lyndhurst Road Congregational Church, Hampstead, were built from designs by Messrs. Spalding & Spalding at a cost of £10,000.

A new church was built at Catford from designs by Mr. Philip A. Robson, A.R.I.B.A.

Christ Church, Moss Side, Manchester, was built from designs by Mr. W. Cecil Hardisty.

The restoration of the fine fifteenth-century church of St. Columb Major, Cornwall, was completed under the direction of Mr. G. H. Fellowes Prynn.

The restoration of the church of St. Bartholomew-the-Great, Smithfield, which has been carried out by Sir Aston Webb, R.A., reached its final stage when on December 2nd the Bishop of London reopened and dedicated three bays of the east cloister—once used as a stable.

Cathedrals and Abbeys.

Throughout the year the foundation work of Liverpool Cathedral has been carried on without intermission, and in November Mr. Gilbert Scott, the architect, was able to announce to the cathedral committee that the foundations would be completed by March 1st next, when the building of the cathedral proper will be proceeded with. About 180 men have been regularly employed. The foundations for the great twin towers, which will be 275ft. high, each comprise four piers 32ft. square at the base and tapering to 16ft. square at the top. They have been carried down to an average depth of 43ft. to the rock.

At the beginning of the year alarmist reports about the safety of St. Paul's Cathedral were circulated, though, as a matter of fact, there was nothing to occasion unnecessary anxiety. A fissure in the southern transept undoubtedly exists, and various other portions of the building have needed attention. During the year considerable advance has been made with the work of repair under the direction of the cathedral architect, Mr. Somers Clarke, who has taken down the whole of the vault over the west portico and rebuilt it. St. Paul's has also been the subject of special attention by reason of



Additions to All Souls Church, Hampstead.
Nicholson and Corlette, Architects.

the opening of a new chapel dedicated to the Knights of the Order of St. Michael and St. George, at the south-western end of the building, where Alfred Stevens's Wellington memorial formerly stood.

Serious dilapidations at Winchester Cathedral were discovered, and it was found imperative to shore up the walls at the east end to prevent a collapse. Mr. T. G. Jackson, R.A., and Mr. Francis Fox, the eminent engineer, were called in to consult with Mr. J. B. Colson, surveyor to the cathedral. Underpinning is to be carried out, and the aisle roofs renewed. The west front, too, requires immediate attention.

The massive tower pinnacles of Bath Abbey, one of which was struck by lightning, were taken down and are to be re-erected on a smaller scale. Mr. T. G. Jackson, R.A., is the architect in charge.

At Tintern Abbey a considerable amount of repair work was carried out under the supervision of the architect for the Crown, Mr. F. W. Waller. Most important was the re-setting of the stonework in the great east window, which had got into a dangerous state. Some pieces of the main tracery which had fallen were found, and it was thus possible to complete the large ring in the head of the window, and at the same time add to the stability of the whole.

Many lengthy letters appeared in the Scottish press in regard to the restoration of



Wakefield Cathedral Extension.
The late J. L. Pearson, R.A., Architect.



Rood Screen, St. Alban's Church, Southend-on-Sea.
Nicholson & Corlette, Architects.



Iona Cathedral, showing North Transept. John Honeyman, Architect.

Iona Cathedral, which has been carried out under the direction of Mr. J. Honeyman, of Glasgow. It was urged that the restoration was not needed, and that the work which had been carried out was unsatisfactory, the carving being inferior and the roof varying in colour. Mr. Honeyman replied to the charges, and there the matter ended. For the present, work is stopped for want of funds. The choir, south aisle, south transept and tower were roofed nearly four years ago, but

it was only this summer that the building was enclosed and made fit for use by the completion of the north transept, the gable of which had been demolished some considerable time ago and had since stood roofless. The gable was rebuilt in the same plain style which was so markedly characteristic of the old buildings.

Mr. Somers Clarke reported that £5,000 would be needed to carry out repairs and restorations at Chichester Cathedral, where the bell tower and roof call for most urgent attention.

Considerable discussion took place in reference to the rebuilding of the flying buttresses on the south side of the nave of York Minster. Mr. Bodley, the architect, however, showed that buttresses had originally existed complete—seven old prints in the Minster library represent them so—but they were suffered to get out of repair and were partially or entirely pulled down at a time when church architecture was at its lowest ebb. He also showed that although the nave is not stone-vaulted, having a timber roof, it was a fact that the roof was pushing out the clearstory walls, so that flying buttresses were indispensable.



J. T. Micklethwaite and Somers Clarke, Architects.

Rural By-Laws.

Rural by-laws were the subject of much public discussion, though nothing was done during the year to put the matter on a really satisfactory basis. In May, however, the Public Health Act Amendment Bill was read a second time in the House of Lords and referred to a select committee. This Bill is a step in the right direction of securing more reasonable by-laws for rural districts. The need for such by-laws was instanced by numerous cases throughout the year.

Exploration and Discovery.

Early in the year what was characterized as the greatest discovery ever made in Egypt was announced. This was the tomb of Yua and Thua found by Mr. Theodore M. Davis in the Valley of the Tombs of the Kings. It had not been touched since the 18th Dynasty (about 4,000 years ago) and was filled with articles of decoration; chairs, boxes, and a chariot in the most excellent state of preservation—all covered with gold.

At Knossos, in Crete, Dr. Evans traced the paved Minoan way leading from the wonderful palace to the hillside opposite, and here discovered a "little palace" reproducing in its general style and arrangement the larger one to the east. A wholly new type of Mycenaean column was found, with fluting in relief.



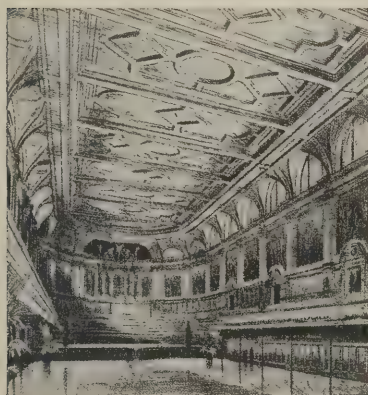
Walsall Town Hall. J. S. Gibson, Architect.
Photo: Bullock.



New City Hall, Hull.
Joseph H. Hirst, City Architect.



New Corn Exchange and Covered Markets, Hull.
Joseph H. Hirst, City Architect.



Design for the Usher Hall, Edinburgh. R. Morham (City Architect) and James A. Williamson (Deputy City Architect).



Assembly Room, Sutton Coldfield Town Hall.
Arthur R. Mayston, Architect.



Car-building and Repair Works, Hyde Road, Manchester.
John Gibbons, Architect. *Photo: Guttenberg.*



Proposed Municipal Buildings, Town Hall and Law Courts, Bournemouth.
F. W. Lacey and C. E. Mallows, Joint Architects.



Kingsweston Estate Offices, near Bristol. F. Bligh Bond, Architect.



Central Hall, Eccles. Edward Hewitt, Architect.



The Proposed County Hall for London. Drawing of Sketch Design by Hedley Fitton.

Town Hall and Municipal Buildings.

The subject of a new county hall for London came up for general discussion in the early part of the year, and at last, in April, the Establishment Committee brought forward a suggestion to acquire a site just below Westminster Bridge, on the southern bank of the Thames. This the Council adopted, deciding to spend £600,000 on the site, £1,056,000 on the building, and £44,000 on the formation of an embankment in front, a total of nearly one and three-quarter millions. For this proposed huge building the Council's architect, Mr. W. E. Riley, prepared a sketch design (shown by Mr. Hedley Fitton's drawing above, which originally appeared in the "Pall Mall Magazine" some months ago), but it seems probable that the work will be the subject of a large open competition. Prior to the decision about the site being arrived at, a scheme for building a county hall on a new bridge across the Thames, at Arundel Street, was put forward by Mr. A. R. Bennett.

Deptford's new town hall was opened in July. The design, by Messrs. Lanchester & Rickards, was the outcome of a competition. The total cost of the building has been about £50,000.

The new municipal buildings at Walsall were opened on September 27th. The cost was £101,000. Mr. J. S. Gibson, F.R.I.B.A., was the architect.

New municipal buildings at Tottenham were opened in November. They have cost £70,000, the architects being Messrs. Arnold S. Tayler & A. R. Jemmett.

A scheme for municipal buildings, law courts and town hall at Bournemouth was

adopted by the town council. This has been prepared by Mr. F. W. Lacey, C.E., F.R.I.B.A., borough engineer of Bournemouth, and Mr. C. E. Mallows, F.R.I.B.A., of London, and is estimated to cost altogether £126,000. The law courts occupy the right-hand wing, the municipal buildings the left-hand wing, and the town hall the back of the site.

The new municipal buildings at Crewe were opened in July. They occupy a site adjoining the market hall in Earle Street, and have cost about £20,000. Mr. Henry T. Hare was the architect.

On May 24th the foundation-stone of the new town hall at Sutton Coldfield was laid. This building is to cost £10,000. The architect is Mr. Arthur R. Mayston, of London.

On July 28th the foundation-stone of the Bradford Town Hall extension was laid. This work is being carried out from designs by Mr. F. E. P. Edwards, the city architect, in consultation with Mr. R. Norman Shaw, R.A.

At Aberdeen the plans prepared by the burgh surveyor for the reconstruction of the town house, at an estimated cost of £100,000, were discussed.

Work on the huge new city hall at Belfast, which is to cost £350,000, was proceeded with steadily, more especially in the decoration of the interior, where rich marbles have been used profusely. Mr. A. Brumwell Thomas, F.R.I.B.A., of London, is the architect.

New municipal buildings at South Shields were opened on September 27th. Mr. E. E. Fetch was the architect. The cost was £48,000.

Kingsway and Aldwych.

Kingsway, the great new thoroughfare leading from Holborn to the Strand, and its crescent, Aldwych, were formally opened by the King on October 18th. The estimated gross cost of the improvement is nearly £5,000,000, and the estimated recoupment a little over £4,000,000, thus reducing the nett cost to £750,000. Mr. Maurice Fitzmaurice, engineer to the London County Council, had charge of the work.

Institute Affairs.

In his presidential address in November Mr. Belcher announced the proposal to acquire a freehold site in Portland Place for a new home for the Institute. Subsequently a memorial signed by Fellows and Associates was presented asking that the building might be the subject of an open competition.

In May, at a meeting of local Associates of the Institute held at Leeds, a protest was made against the practice of direct election to the Fellowship without the candidate being required to pass any examination. This protest received support in many other provincial quarters. In reply, the Institute stated it was not fair or politic to call suddenly upon architects between thirty and forty years of age, in the full tide of busy practice, to pass an examination, or otherwise be excluded for ever from the Institute.

The annual dinner was held at Newcastle in October, and visits were paid to places in and around the town.

A group of able architects, including Mr. Mervyn Macartney, who had left the Institute or never been members of it, agreed to join hands with it, in view of the requirements and arrangements for architectural education.

Registration.

In July the Institute Registration Bill—or, as it is called, the Bill for the Statutory Enrolment of Architects—was issued. There were no startling proposals in it, but a number of points hitherto in doubt were defined. It was proposed to come into force on July 1st, 1907, and a committee is at present appointed to take evidence on the matter. Though the council elections were quite against the old registrationists it was significant to note that Mr. Belcher in his presidential address to the Institute in November said that though considerable diversity of opinion still existed, and it was scarcely possible that the Bill should pass into law, "yet some remedy must be found for the present evils; we cannot be indifferent to the interests of the many able men upon whom existing conditions press so hard."

It is hoped to call a special meeting of the Institute early in the new year to receive the report on registration drawn up by the council and the registration committee.



New Tramway Offices, Hatton Garden, Liverpool.
Thomas Shelmerdine, Corporation Architect and Surveyor.



The Waldorf Theatre, Aldwych, London.
W. G. R. Sprague, Architect.



New Offices for "Country Life," Tavistock Street, Covent Garden, London. E. L. Lutyens, Architect.



New Buildings for Co-Operative Wholesale Society, Ltd., at Broad Quay, Bristol. F. E. L. Harris, Architect.



New Premises, Oxford Street, London, for Waring & Gillow, Ltd. R. Frank Atkinson, Architect.



New Premises for Edinburgh Life Assurance Co., St. Vincent Street, Glasgow. John A. Campbell, Architect.

Business Premises.

The new block of shipping offices for the Red Star, White Star and other lines was completed before the summer on a prominent site in Cockspur Street, facing down Pall Mall, London. The architect was Mr. Henry Tanner, junior, A.R.I.B.A., of London, and the contractors were the Waring White Building Co., Ltd.

The huge new premises for Messrs. Waring & Gillow, Ltd., in Oxford Street, London, were erected, so far as the outside is concerned, and work on the interior well advanced. The architect is Mr. R. Frank Atkinson, F.R.I.B.A.

New business premises on High Holborn, facing the Holborn Restaurant, were completed from designs by Mr. H. Percy Adams.

Baltic House, Leadenhall Street, London, was completed early in the year for the City Offices Co. This is a very large office building. The architects were Messrs. Gordon & Gunton and the builders Messrs. Patman & Fotheringham, Ltd.

New premises at Broad Quay, Bristol, for the Co-Operative Wholesale Society, Ltd., were erected from designs by Mr. F. E. L. Harris, A.R.I.B.A., of Manchester.

New premises for the Edinburgh Life Assurance Co., at 122 and 128, St. Vincent Street, Glasgow, were erected from designs by Mr. John A. Campbell. The front is of white freestone, with steel framework,

columns being encased in brickwork and beams in concrete.

A block of offices for the Bennett Steamship Co. in Tooley Street, London, S.E., was built from designs by Mr. Stanley D. Adshead.

New offices for the Sanitas Co., Ltd., were erected in Locksley Street, Limehouse, E. Mr. Arthur T. Bolton was the architect.

At Liverpool substantial progress was made with the erection of the huge new offices for the Mersey Docks and Harbour Board on the site of St. George's Dock.

At Sunderland a new building for the York City and County Bank was erected in Fawcett Street, Mr. Walter H. Brierley being the architect.

New head offices for the State Fire Insurance Co. in Dale Street, Liverpool, were erected from designs by Mr. W. Aubrey Thomas. They were opened in June.

Colonial House, Liverpool, the large block of new offices for Messrs. Elder, Dempster & Co. at the corner of Water Street and Tower Gardens, was completed and opened.

New premises for the Phoenix Insurance Co., in South Parade, Leeds, were erected from designs by Mr. William H. Thorp.

New premises for the Professional and Civil Service Supply Association, Ltd., at 80, George Street, Edinburgh were erected, Messrs. John Burnet & Son being the archi-

itects. At Edinburgh, too, new offices of the North British and Mercantile Insurance Co. were erected in Princes Street, from designs by Messrs. Peddie & Washington-Browne, who were also the architects for the British Linen Co.'s new bank in George Street.

A new factory for the manufacture of spirit varnish and the bleaching of shellac was built at Brimsdown, Middlesex, from designs by Mr. H. P. Burke Downing.

At Bristol new premises for the London and Lancashire Fire Insurance Co. were built from designs by Mr. Edward Gabriel, of London.

New offices for Messrs. Fairweather & Sons, tobacco manufacturers, were erected in the new Seagate, Dundee, at a cost of £7,000, Messrs. Charles Ower & Co., of Dundee, being the architects. Reinforced concrete was used for the foundations. Behind the offices are the firm's works, which are among the most complete in Scotland.

At Bristol new offices for the Phoenix Insurance Co. in Clare Street were completed at a cost of about £5,000. The design accords with some of the older eighteenth-century Bristol houses, now past and gone, of which the deeply-projecting cornices and window pediments were striking features. In the Phoenix building the rustication of the lower part is made to represent curling tongues of flame. Mr. F. Bligh Bond, F.R.I.B.A., of Bristol, was the architect.



The Ritz Hotel, Piccadilly, London.
Mewes and Davis and John P. Bishop, Architects.

A unique building in Basnett Street, Liverpool, is being erected by Messrs. E. F. Blakeley & Co., constructional engineers, of Vauxhall Ironworks, Liverpool. This is the premises of Messrs. George Henry Lee & Co., Ltd., silk mercers and general drapers. The whole of the front and one end are to be built exclusively of ironwork, with highly decorated cast pilasters; steel framework being used for the window frames—no masonry appearing whatever. Messrs. Matear & Simon are the architects, and Mr. Henry Woodhouse is the engineer for the work. New works at Ellesmere Port were designed and erected by Messrs. Blakeley for the Wolverhampton Corrugated Iron Co., Ltd.

Hotels and Restaurants.

The Ritz Hotel in Piccadilly, London, was brought well on to completion. It is to be finished for the next season—about March, 1906. The contractors are the Waring White Building Co., Ltd.

The new Gaiety Hotel in the Strand, erected from designs by Mr. R. Norman Shaw and Messrs. Runtz & Ford, was opened in May. The contractor was Mr. Carmichael. The building is of Portland stone, and the cornice, at a height of 80ft., is the largest in London. The chief features of the interior are the restaurant (over which is the ball-room), the Adam banqueting hall, the masonic temple and the Dutch buffet.

Early in the year the design was published for the new hotel which is to be erected in Piccadilly from designs by Messrs. William Woodward and Walter Emden. The site is that formerly occupied by St. James's Hall and Restaurant, which block was demolished,



Gaiety Restaurant, London. Runtz and Ford, Architects.



Gaiety Hotel and Theatre, Strand, London.
Runtz and Ford and R. Norman Shaw, Architects.

the well-known organ of the hall going to the new town hall at High Wycombe. The hotel will have a frontage also in Regent Street Quadrant, and considerable disquietude among architects was evinced in regard to this. Fortunately, the aid of Mr. Norman Shaw, R.A., was secured by the Crown (who are the ground landlords), and it is hoped that nothing will be done to destroy the present harmony of the Quadrant.

Frascati's Restaurant was re-decorated and enlarged under the direction of Mr. Charles H. Worley, F.R.I.B.A. A masonic temple is now included in the building.

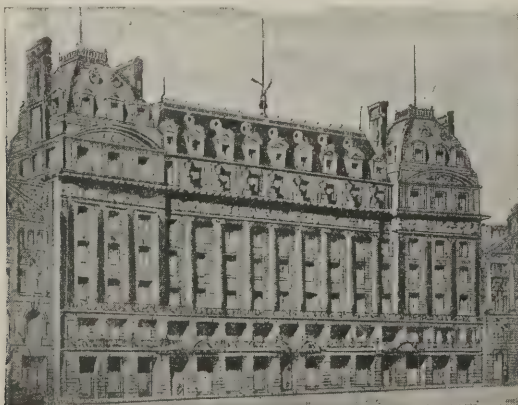
In the south-west of London, at Stockwell,



Ingram House, Stockwell, London: End of Library Wing. Arthur T. Bolton, Architect.

Ingram House, the residential club for young men, was completed and opened in November. The plan is that of a St. Andrew's cross. There are four floors of bedrooms above two floors of social rooms, accommodating 208 residents. Mr. Arthur T. Bolton was the architect.

The Peebles Hydropathic was destroyed by fire, and a new design for the rebuilding was prepared by Mr. James Miller, of Glasgow, estimated to cost about £35,000.



The Waldorf Hotel, Aldwych, London.
A. Marshall Mackenzie and Son, Architects.



The Piccadilly Hotel, Piccadilly, London.
William Woodward and Walter Emden, Joint Architects.



Shipping Offices, Cockspur Street, London.
Henry Tanner, junr., Architect.



Phoenix Offices, South Parade, Leeds.
William H. Thorp, Architect.



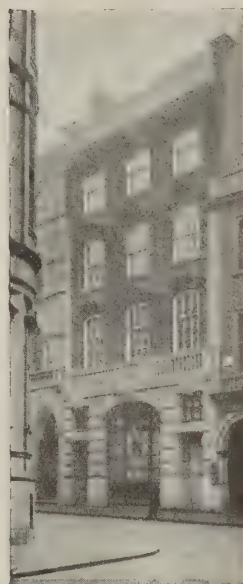
Nos. 352 and 354, Oxford Street, London.
George Hornblower, Architect.



Baltic House, Leadenhall Street, London.
Gordon and Gunton, Architects.



New Premises for Professional and Civil Service
Supply Association, George Street, Edinburgh.
John Burnet & Son, Architects.



New Offices for Phoenix Insurance
Co., 22, Clare Street, Bristol.
F. Bligh Bond, Architect.



New Offices for the Mersey Docks and Harbour Board, Liverpool.
Briggs and Wolstenholme, F. B. Hobbs and Arnold Thornely, Architects.



H. P. Burke Downing, Architect.



New Offices for the Sanitas Co., Locksley Street, Limehouse, E.
Arthur T. Bolton, Architect.



Shipping Offices, Tooley Street, London.
Stanley D. Adshead, Architect.



New Premises for Lee & Co. at Basnett Street, Liverpool.
Matear and Simon, Architects. Steelwork by E. F. Blakeley & Co.

Business Items.

Messrs. Orenstein & Koppel amalgamated with Mr. Arthur Koppel. The total paid-up capital of the two firms is £1,100,000.

Wallpaper Manufacturers, Ltd., made a profit of £243,227, and declared a dividend of 8 per cent. on their ordinary shares. They also purchased the Lincrusta business of Messrs. Frederick Walton & Co., Ltd.

The Bath Stone Firms, Ltd., paid an interim dividend of 14 per cent. per annum, having made a nett profit of £18,509 for the half year ended June 30th last.

Messrs. R. Neill & Sons, builders and contractors, of Manchester and Newcastle, secured the contract (£150,000) for the widening of the L. & N.W. railway at London Road, Manchester.

Messrs. James Crispin & Sons erected heating, ventilating and hot-water supply apparatus at the new art gallery at Bristol.

The Well Fire Co., Ltd., of Darlington, supplied more than sixty of their fires for the new town hall at Walsall and also for the cheap cottages exhibition at Letchworth, and the new schools for University College at Hampstead.

The Columbian Fireproofing Co., Ltd., executed the whole of the fireproof flooring at the Ritz Hotel in Piccadilly, Waring & Gillow's new premises in Oxford Street, the new offices of the Shipping Combine in Cockspur Street, and at many other important buildings.

Mr. Robert Adams, of 3 and 5, Emerald Street, Holborn, W.C., supplied his patent fittings to a number of important buildings, among them being the new War Office.

New Towns.

Outside Bristol has been springing-up the township of Avonmouth, now a place of much possibility by reason of the docks in progress there and the making of it a place of call for the American and African trading steamers of Messrs. Elder, Dempster & Co. Practically all the land—known as the Kingsweston estate—is owned by Mr. Philip Napier Miles, J.P., who has laid out a series of fine roads, and it is his intention that the new township shall be controlled on architectural lines. To this end he has appointed Mr. F. Bligh Bond, F.R.I.B.A., of Bristol, consulting architect for all work on the estate. A large number of artisans' dwellings and shops have been erected, together with a few buildings of public character. Among the latter are the Kingsweston Estate Offices (see p. 19) completed this year from Mr. Bond's design.

Late in the year Mr. John Cory's scheme for laying out a garden city at Peterston, near Cardiff, was made public. On a site of about 200 acres the city is proposed to be developed on a circular plan, with a green in the centre, each house being allotted about one-sixth of an acre. The architect in charge of the work is Mr. W. Beddoe Rees, of Cardiff. A scheme is being prepared by which 80 or 85 per cent. of the money to build houses will be provided on security of the lease.

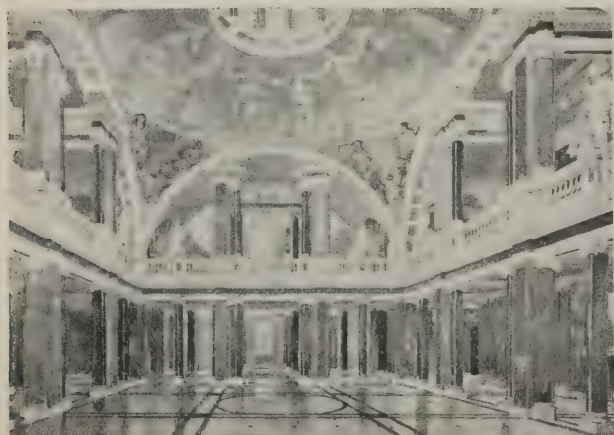
Prizes and Studentships.

The designs sent in for the prizes and studentships offered by the Royal Institute of British Architects were this year of very fair merit. The subjects of the Soane and Tite were perhaps somewhat too elaborate, the former being a royal palace, for which Mr. S. Herbert Maw, of Bolton, was successful, and the latter a hotel lounge and staircase, for which Mr. Robert Atkinson, of Nottingham, was successful. The essay medal was won by Miss Ethel M. Charles, A.R.I.B.A., of London; the measured drawings prize by Mr. E. G. Wylie, of Glasgow; the Pugin by Mr. E. Garrett; the Arthur Cates by Mr. F. Winton Newman; and the Grissell by Mr. J. A. M. Hunter, of Aberdeen.

At the Royal Academy Mr. Leslie Wilkinson, for the second year in succession, won the gold medal and travelling studentship (value £200) by his design for a British embassy in a foreign capital.



Soane Medallion Design for a Royal Palace, by S. H. Maw.



Tite Prize Design for Hotel Lounge and Staircase, by Robert Atkinson.



Grissell Prize Design for a Winter Garden, by J. A. M. Hunter.



£150 Cottage, Class 1, First Prize (£100).
Percy B. Houfton, Architect.



£100 Prize for the Cheapest Cottage. A. H. Clough.



Cottage, Class 4, First Prize (£100).
A. Randall Wells, Architect.



Group of Four Cottages, Class 3, First Prize (£25). Geoffrey Lucas, Architect.



Wooden Cottage, First Prize (£50).
F. W. Troup, Architect.

Cheap Cottages Exhibition.

From July to September an exhibition of cheap cottages, arranged by the "County Gentleman," was held at Letchworth (Garden City), Hertfordshire, by favour of the Garden City Company. The exhibition was primarily intended to demonstrate the possibility of erecting suitable cottages for agricultural labourers at a cost of not more than £150. The conditions of the competition, however, were such that this object was not fulfilled, and the cottages generally cost more than that sum. The first prize for a cottage to cost not more than £150 was awarded to

Messrs. Green Brothers, of Whittington, near Chesterfield, Mr. Percy Houfton, of Chesterfield being the architect. The second prize in this class (of £50) was awarded to Messrs. Bennett and Bidwell, of Letchworth. Both of these cottages were of brick. The third prize of £25 was secured by Messrs. Potter & Co., of 66, Victoria Street, S.W., for a concrete *in situ* bungalow. The prize of £100 offered for the cheapest cottage in the exhibition was secured by Mr. A. H. Clough, of Burley, Ringwood, this being also a brick cottage. The first prize for a wooden cottage was awarded to Mr. F. W. Troup, of London; and the first prize for a pair of cottages (cost not to exceed £300) to Messrs. Potter & Co., the construction in this latter being plaster on expanded metal. In the third class, for a group of three or four cottages (cost not to exceed £35 per room), the prize was won by Mr. Geoffrey Lucas, of London and Hitchin; and in class 4, for a detached cottage (cost not to exceed £35 per room), Mr. A. Randall Wells, of



Prize Cottage of Concrete Blocks, by Concrete Machinery Co. Gilbert Fraser, Architect.

Hastings, won the prize of £100. A special prize for a cottage built of concrete was awarded to the Concrete Machinery Co., of Liverpool (Mr. Gilbert Fraser, architect). The result of the exhibition goes to show that under the conditions that prevailed at Letchworth brick cottages can be erected as cheaply as those of timber and most patent materials.



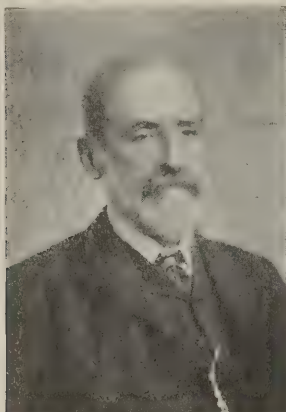
Colshaw Hall, Cheshire: Garden and Entrance Fronts.
Douglas and Minshull, Architects.



Cottage at Chislehurst. E. J. May, Architect.

Personal.

At the end of February a complimentary dinner was given to Mr. R. Phené Spiers at Pagini's Restaurant, when an address was



R. Phené Spiers.

presented to him in testimony of his abilities. Sir Aston Webb presided.

At the end of January the elections to fill the three vacancies in the ranks of the Royal Academicians took place, and



Reginald Blomfield, A.R.A.

Mr. Reginald Blomfield gained his fauteuil among the architect Academicians. The elections were made from a list of 93 painter candidates, 17 sculptors and 39 architects. Among the last named, however, there was only one new candidate—Sir William Emerson.



A. E. Pridmore, President of the Society of Architects.

Mr. A. E. Pridmore was elected president of the Society of Architects.

Among the foremost firms of English contractors are Messrs. Patman & Fotheringham, Ltd., noted especially for the speed with which they accomplish large works, a point upon which great insistence is nowadays placed. The firm have been largely engaged in the erection of theatres, and their work at the London Coliseum recently brought them into prominence. Their experience in this direction was especially valuable in connection with the repair work necessitated by the crack discovered in the proscenium arch of His Majesty's Theatre, Haymarket, London, which caused somewhat of a scare and forced Mr. Tree to suddenly close the house. This work was performed in the extremely quick time of two weeks. Messrs. Patman & Fotheringham, of which Mr. James F. Parker is managing director, have also carried out during the year Messrs. Pawson & Leaf's new premises in St. Paul's Churchyard, and were engaged on the reconstruction of the Avenue Theatre, which was ruined by the terrible collapse of Charing Cross Station roof on December 5th.

Another of our foremost builders is Mr. Howell J. Williams, who has had a good deal of work in hand this year, especially in the direction of commercial offices. Mr. Williams is a member of the council of the London Master-Builders' Association. His firm, Howell J. Williams, Ltd., have erected new premises in Fetter Lane and Norwich Street for Messrs. Harrild & Sons, printers' machinery and roller manufacturers; new banking premises in Fenchurch Street, E.C., for Messrs. Kleinwort; the east block for the northern district post-office at Islington; extensions and alterations to the London Fever Hospital in Liverpool Road; and Messrs. Spottiswoode & Co.'s new printing premises in New Street Square, E.C. Mr. Williams can claim a considerable experience in the erection of printing premises. The most notable building of this kind which he has erected is the "Daily Mail" and "Evening News" printing and publishing block in Carmelite Street.

At the annual dinner of the London Master-Builders' Association held in February Mr. J. Howard Colls was presented with the portrait of himself painted by Mr. Orchardson. The portrait was hung in this year's Academy.

Sir Caspar Purdon Clarke, C.I.E., F.R.I.B.A., resigned his office of Director of the Victoria and Albert Museum, South Kensington, after twenty-five years' service, and went to New York as Director of the Metropolitan Museum of Fine Arts.

Mr. John Belcher, A.R.A., was entertained at dinner in April by his past and present staff, in honour of his election as president of the R.I.B.A.

Professor Beresford Pite was appointed director of architectural instruction and lecturer on architectural subjects at the L.C.C. School of Building at Brixton.

The Royal Gold Medallist.

The Royal Gold Medal this year was awarded to Sir Aston Webb, R.A., well-known for his numerous important buildings, including the Birmingham Law Courts, the new Bluecoat School at Horsham, the new Naval College at Dartmouth, the completion of the South Kensington Museum, the Royal College of Science (opposite the Imperial Institute), the National Memorial to Queen Victoria and the restoration of St. Bartholomew's. At the Academy he exhibited his treatment for the triumphal arch which is to be erected at the end of the Mall leading into Trafalgar Square. This is likely to have a very dignified appearance when erected.

The Waring White Building Co., Ltd., are a new firm of contractors who have made great strides in the past year towards obtaining a foremost place, having secured a number



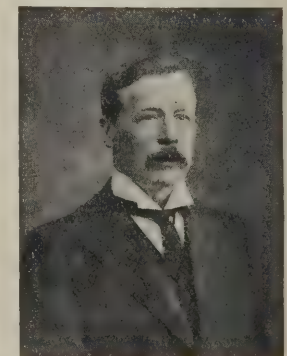
R. A. Denell, Managing Director, Waring White Building Co., Ltd.

of important contracts. The company was started by Messrs. Waring, the well-known furnishing firm (who also have their building department), and Messrs. J. G. White & Co., Ltd., the large contractors for tramways and other engineering works. It is the expressed intention of this firm to combine the best English and American methods of



James F. Parker, Managing Director, Patman and Fotheringham, Ltd.

erecting buildings. Their part in the erection of the Ritz Hotel, a steel frame construction, has brought them prominently before the public. The managing director is Mr. R. A. Denell, a licensed architect of the United States, who has had much experience, especially with Messrs. D. H. Burnham & Co., one of the largest firms of architects in



Howell J. Williams, Managing Director, Howell J. Williams, Ltd.

America, and perhaps the originators of the American office building. Mr. Denell recently read a paper before the R.I.B.A. upon the subject of American methods of erecting buildings in which he gave much valuable information.



New Sea-defence Works and Marine Parade, Blackpool.
John S. Brodie, Borough Engineer.

Engineering Works.

Blackpool's new sea defence works and marine promenades, after occupying nearly three years in construction at a cost of little short of £450,000, were completed by the end of July. The new works extend from the south shore to the north pier. The central and southern sea-defence works and promenades were commenced in May, 1903, and completed as far as the north pier in June last. The area reclaimed from the seashore is 22 acres. Between the sea and the buildings fronting are an easterly footway 15ft to 30ft. wide, a new carriage drive 40ft. wide, an island footway 10ft. wide, a tramway track 17ft. 6ins. to 20ft. 6ins. wide, while the average width of the broad westerly footway or parade is 80ft. There are also, leading to the foreshore or sands, thirty-five flights of steps 15ft. wide, and six roadways 30ft. wide. The engineer for the work was Mr. John S. Brodie, A.M.I.C.E., borough engineer and surveyor for Blackpool.

The new pier at Falmouth was completed, after two years' work, at a cost of £7,000. It is 310ft. long, the portion nearest the town being granite work, and the rest, for a length of 200ft., constructed on the Hennebique system of reinforced concrete.

A new lighthouse on the extremity of Portland Bill was completed.

Bridges, New and Old.

Considerable discussion throughout the year centred round the old Bridge of Ayr, which for some time has been in a very unsatisfactory condition. The proposal of the town council was first to pull down the old structure and erect a new bridge, but considerable opposition was raised to this, and in the end, after reports by various well-known engineers and architects, the town council in October granted four months' respite to enable the objectors to show how the old bridge could be preserved and at the same time repaired sufficiently to keep it stable.

The transporter bridge across the Mersey at Runcorn was opened in May. It has cost £130,000, and is on the same principle as that at Newport, Mon., namely, with the car suspended by guys from an electrically-driven trolley running across the main girder of the bridge.

The work of erecting the superstructure of the new Vauxhall Bridge was proceeded with, the huge steel spans being put in place, but it is not likely that the bridge will be completed before next March. Its total cost is expected to be nearly £400,000.

At Exeter the old stone bridge over the river was replaced by a one-span steel bridge built at a cost of £25,000 from designs by Sir John Wolfe Barry and Mr. C. A. Brereton. The new bridge was opened in April.

The great steel bridge over the gorge of the Victoria Falls, South Africa, was completed in April. The floor of the bridge is at a height of 400ft. above the water—the highest in the world.

After having wasted £900 in taking away the fine old bronze lamps which stood on the parapets of Waterloo Bridge, and replacing them with some spidery electric-light standards, the London County Council decided in July to replace the old lamps at an additional cost of £600.

The Stoneferry Bridge across the River Hull, about two miles from the Humber, was opened on October 16th. It is a steel swing bridge and cost £20,000. It was designed by the city engineer, Mr. A. E. White.

Miscellaneous.

The sixth International Building Trades' Exhibition was held in April at the Royal Agricultural Hall, Islington, and proved a great success. There were about 300 separate exhibitors.

In April the Egyptian Hall in Piccadilly was pulled down. It was erected in 1812, at a cost of £16,000, for a natural history museum.

At No. 47, Brook Street West, London, a reproduction of the Palace of Artaxerxes at Susa was carried out for Mr. Bland-Sutton as a dining-room 40ft. square. It was executed by Mr. F. Arthur under the direction of Mr. Herbert E. Wheeler, of London. The columns are in scagliola and the friezes in enamelled brick.

A large chimney was built at the Birmingham Corporation electricity station in Sumner Lane. It is 250ft. high and 24ft. external diameter at the bottom, tapering to 17ft. 4ins. at the top; weight 2,750 tons. This is the largest chimney in Birmingham.

No. 17, Fleet Street, London, upon the acquisition and restoration of which the London County Council (after much discussion and many delays) decided to spend £27,000, was taken in hand, and the portions of the old front exposed. The result, however, can hardly be called satisfactory.



No. 17, Fleet Street, London, as Restored by W. E. Riley, Superintending Architect, L.C.C.



New Bridge at Exeter. Sir John Wolfe Barry and C. A. Brereton, Engineers.



The Auld Brig of Ayr.

At Sheffield the new front of the Midland passenger station was completed.

At Edinburgh the exhibition of "architectural refinements" in mediæval buildings, organized by Mr. Henry Goodyear, of Brooklyn, and held under the auspices of the Edinburgh Architectural Association, was opened by the Earl of Wemyss on September 6th.

Watts's famous equestrian figure of "Physical Energy" was removed from the quadrangle of Burlington House, and shipped to South Africa, where it will be erected, not on the Matoppos as originally intended, but at Groot Schuur, the Cape Town residence of the late Mr. Cecil Rhodes.

An archæological congress was held at Athens in April.

The most important scheme brought forward in Manchester for many years was presented to the City Council in October. This is for the rebuilding of about twenty-five acres between Oldham Street, Victoria Street, Market Street and Cannon Street. The total estimated cost is £1,300,000, but the nett cost is put at £250,000. The proposal is not yet settled.

The Usher Hall at Edinburgh came up for discussion from time to time, but eventually a design prepared by Mr. Morham, the city architect, and Mr. J. Williamson, deputy city architect, was adopted by the committee of the town council, though the site for the building is not yet settled, some objections being still raised to the proposal to pull down the Synod Hall in Castle Terrace. The estimated cost of the hall is £78,270.

An electrical exhibition, organized under the patronage of the Institution of Electrical Engineers, and under the auspices of the National Electrical Manufacturers' Association, was held at Olympia in October.

The restoration of Abergwili Palace, which was considerably damaged by fire last year, was completed under the direction of Mr. W. D. Caröe for the Bishop of St. David's.

The Waldorf Theatre at one end of Aldwych, London, and the Hicks Theatre at the corner of Kingsway, near by, were erected, Mr. W. G. R. Sprague being the architect of both. The Scala Theatre, off Tottenham Court Road, was also completed (Mr. Frank T. Verity, architect).

LAW CASES OF THE YEAR.

Ownership of Drawings—*Gibbon v. Pease*.

—This important case was decided in the Court of Appeal on March 24th, having been taken to the higher Court from a judgment given by Mr. Justice Ridley. It concerned the retention of plans and papers in connection with the conversion of the upper parts of some houses into residential flats. The defendant was the architect for the work, which was carried out under his supervision. After the work was finished, however, the plaintiff claimed all the plans, specifications and papers prepared and used by the architect in the execution of the alterations. Defendant denied his right to such possession, contending that the plans should remain his property. In the lower Court, however, Mr. Justice Ridley had given a decision that the plans were to be handed over to the plaintiff as claimed, and this judgment was upheld by the Court of Appeal, who dismissed the present case with costs, holding that as the architect had performed his contract and been paid for it, the plans and papers were the property of the building owner. Thus the judgment in the well-known case of *Ebdy v. McGowan* was confirmed. Architects much resented the decision in this latter case, and contributions from the R.I.B.A., the Society of Architects and the Surveyors' Institution were made towards *Gibbon v. Pease*.

Right of Light—*Ambler v. the Bishop of Leeds*.—Mr. Justice Bray, sitting in the King's Bench Division, delivered his considered judgment in this case on January 20th. The plaintiff was an architect occupying an office on the first floor of some premises in Cookridge Street, Leeds, and it was contended that the light to this office was materially diminished by the erection of the new Roman Catholic Cathedral opposite. The point raised was whether an architect requiring an ordinary amount of light was entitled to include his business under the heading of "special businesses." Mr. Justice Bray, following the House of Lords' decision in *Colls v. Home and Colonial Stores*, held that, although there had been diminution of light, sufficient remained for all the purposes of the ordinary user. Judgment was therefore entered for the defendant. This case had relation to the finding of the late Mr. Thomas Blashill, who was the umpire appointed by the arbitrators in regard to the point at issue.

City Ancient Lights Case—*Higgins and Barclay, Perkins & Co., Ltd. v. Betts*.—This case was heard in the Chancery Division on May 26th. Plaintiffs were the occupants of a public-house having a frontage of 67ft. to Benjamin Street, E.C. A building on the opposite side which was only 30ft. in height was increased to 38ft., and plaintiffs' dining-room, which used to have 67 degs. of light, was left with only 32 degs. The bar and other rooms also suffered. Mr. Justice Farwell granted an injunction.

Workmen's Compensation.—A number of appeals under the Workmen's Compensation Act were heard during the year. One of the most interesting was that of *Hartley v. Quick*, heard in January. The applicant was a workman in the employment of Quick, who was a builder and contractor engaged in erecting an extension to the corporation electricity generation station at Portsmouth. The workman was injured by falling off the scaffold. At the time of the accident the walls of the new building had been carried up in places to about 20ft., but they were not anywhere connected with the station (which was more than 30ft. high), though the footings for the extension were in absolute touch with the wall of the existing building. The county-court judge held that if the two

buildings were intended ultimately to form one building, or to form two buildings to both of which a party wall was common, absolute attachment of the new to the old building was not necessary so long as the building operations were being carried on in connection with both buildings. He accordingly held that the applicant's employment came within the Act, and gave an award in his favour. The Court of Appeal upheld this decision.

Big Action against Contractors—*Plymouth Corporation v. Pethick Brothers*.—Judgment in this case was given on April 3rd after eight days' hearing in the King's Bench Division. Plaintiffs claimed £25,000 damages for alleged fraudulent misrepresentation and breach of contract for the construction of an underground sewer to take sewage out to sea at low-tide level. The pipes were to be laid in a trench and covered with concrete, and the plaintiffs alleged that, after having sent divers down, they found the work insufficiently executed, the pipes being laid on the bed and not in a trench as agreed upon. Judgment was given in their favour for £20,000 and costs.

Claim for Fees—*Maby and Another v. Lloyd and Others*, trustees of the Hearts of Oak Benefit Society.—This case was concluded on May 19th before Mr. Justice Lawrence and a special jury. The plaintiffs claimed £3,374 for fees and work done as joint architects for the Hearts of Oak Benefit Society. Defendants denied liability, on the grounds that the plaintiffs were invited to send in plans for a building the cost of which was not to exceed £55,000; that their plans having been accepted they were asked to make certain alterations; that the proposed building with the alterations could not be erected for less than £95,000; and that the plaintiffs warranted that their design with the alterations could be carried out at a cost within 10 per cent. of their original estimate. Defendants also counter-claimed for £1,240, fees they had paid to a quantity surveyor in connection with the plaintiffs' plans. After the plaintiffs had been very severely cross-examined, a formal verdict was entered for the defendants on the claim, with costs, the counter-claim being withdrawn without costs.

Contractors' Alleged Negligence—*Phillips v. Kingston, Miller & Co., Ltd.*—Mr. Justice Ridley and a special jury in the King's Bench Division concluded this case on February 8th. Mr. Lionel Phillips, of 33, Grosvenor Square, W., sued the defendants, a firm of contractors of Oxford Street, for damages caused by a fire in a temporary supper-room at the plaintiff's house, in consequence of an alleged defective electric-light installation by the defendants. Defendants denied this. Judgment in their favour was given both on claim and counter-claim.

Building Contracts.—A novel point was raised in a county-court case at Stockton in October. A Middlesbrough builder and contractor named Price sued a Stockton joiner named Mawood for £65 12s., the balance of a contract to build eight houses. The contract was a verbal one, but subsequently Mawood asked Price to put it into writing. Price could neither read nor write, and a man named Earnshaw was engaged to put the contract into writing. Earnshaw made a mistake, and Price did not find out the error until he went for the balance of the contract money. For the defence it was contended that Price could not succeed, but must take action for the rectification of the contract, and then it would have to be shown that the mistake was a mutual one. Judgment was given for Mawood, his Honour remarking that the action by Price was not that of a man who had made a mistake in a contract.

BOOKS OF THE YEAR.

Architecture.

- "A History of Architectural Development." F. M. Simpson. Vol. I. (*Longmans, Green.*)
- "Architecture, East and West." R. Phené Spiers. (*Batsford.*)
- "Gothic Architecture in England." Francis Bond. (*Batsford.*)
- "The Cathedral Builders in England." E. S. Prior. (*Seeley.*)
- "Character of Renaissance Architecture." Charles Herbert Moore. (*Macmillan.*)
- "Studies in Architecture." Reginald Blomfield. (*Macmillan.*)
- "Old and New Architecture in Khiva, Bokhara and Turkestan." O. Olufsen. (*Tofts.*)
- "A History of Architecture on the Comparative Method." Fletcher. 5th edition. (*Batsford.*)
- "Robert Adam." Percy Fitzgerald. (*Fisher Unwin.*)
- "Old Cottages, Farmhouses and other Stone Buildings in the Cotswold District." W. Galsworthy Davie and E. Guy Dawber. (*Batsford.*)
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